POWER SYSTEM STUDY

For

13.2KV DISTRIBUTION SYSTEM
SUNY OSWEGO
Oswego, NY

June 2013

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HMT INC.
High Voltage Maintenance & Technical Services

June 26, 2012

Dave Hutchins
Ridley Electric Co., Inc.
5800 Court Street Road
Syracuse, NY 13206

Re: **SUNY Oswego Electrical System Power System Study**

HMT Job # 13153

Dear Dave:

Attached for your records, please find our calculations, time current curves and recommendations for the above reference study.

Thank you for this opportunity to be of service. If you have any questions please feel free to contact me.

Sincerely

HMT, Inc.

William Dussing, PE
Sr. Electrical Project Engineer

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

This report contains the results of a limited scope Short Circuit and Protective Device Coordination study for the SUNY Oswego Electrical System at the Oswego, NY Facility. Sections 2 and 3 deal with the System Data and the Short Circuit Study respectively. Sections 4 and 5 deal with the Protective Device Coordination Study and Arc Flash Evaluation. The Short Circuit Study printout is included in Section 6. The Input Data computer printout is included in section 7. The computer model one-line diagrams are included under section 8.

This study was performed in accordance with applicable ANSI, NEC and IEEE Standards and based upon data collected by HMT, Ridley Electric, SUNY Oswego and data furnished by National Grid.

1.2 Results and Recommendations

Recommendations made as the result of the above referenced studies are listed below. For additional information refer to the each specific study section of the report.

1. It appears that several of the existing loop feeder cables included in this study are not capable of supporting the connected transformation during single ended use. All loop feeder cables included in this study (except for the 3A/5C – Piez Hall feeder loop) use 1/0 15kV cable. The maximum rating for 1/0 15kV MV-105 cable per the NEC is 215 amps. The maximum rating for 4/0 15kV MV-105 cable is 315 amperes. Other factors affect the rating, such as ductbank configuration, cable thermal rating and load factor to name a few. Complete analysis of these feeders is beyond the scope of this study and requires further attention. The following should be noted:

    a) Loop 1A-1B: Based on connected transformation, the full load current is calculated to be 159.7 amperes. The existing cable appears to be satisfactory for this installation, but should be verified.

    b) Loop 2A-2C: Based on connected transformation, the full load current is calculated to be 195.1 amperes. The existing cable appears to be on the edge of being satisfactory for this installation and should be verified.

    c) Loop 5A-5C: Based on connected transformation, the full load current is calculated to be 233.3 amperes. The existing cable appears to be satisfactory for this installation, but should be verified.

    d) Loop 3B-3C: Based on connected transformation, the full load current is calculated to be 387.1 amperes. This exceeds the rating of this cable. Unmonitored single ended operation of this loop is not recommended.

continued

1.2 Results and Recommendations - continued

e) Loop 4B-4C: Based on connected transformation, the full load current is calculated to be 237.1 amperes. This exceeds the rating of this cable. Unmonitored single ended operation of this loop is not recommended.

2. The existing settings of several secondary main devices warrant further investigation. This investigation is beyond the scope of this study; however, we have provided recommended temporary settings in an effort to provide better coordination with the upstream devices for the interim. Please note, although in most cases these were lowered, the temporary device settings, do not take arc flash hazard into consideration. These temporary settings are located at the end of this section (see table 1.2.A) and in the tabulated recommended settings in Section 4 of this report. It is recommended that these devices and their associated the distribution switchgear be modeled and evaluated for both coordination and arc flash.

3. This facility was found to have twenty-two (22) Dangerous Busses that could not be corrected by settings changes. These have been listed by location with remediation action(s) at the end of Section 5.

a) 1A01A.1 (Lee 480V Transformer Secondary Bus)
b) 1A02.1 (Riggs 208V Transformer Secondary Bus)
c) 1A03.1 (Johnson 208V Transformer Secondary Bus)
d) 1A04.1 (Lakeside 208V Transformer Secondary Bus)
e) 2A01.1 (Swetman 208V Transformer Secondary Bus)
f) 2A02.1 (SNYGG 208V Transformer Secondary Bus)
g) 2A03.1 (Wilbur 208V Transformer Secondary Bus)
h) 3B01.1 (Convocation Center 480V Transformer Secondary Bus)
i) 3B02.1 (Penfield 480V Transformer Secondary Bus)
j) 3B03.1 (Lanigan 208V Transformer Secondary Bus)
k) 3B04.1 (Mahar 208V Transformer Secondary Bus)
l) 3C02.1 (Cooper 208V Transformer Secondary Bus)
m) 3C04.1 (Culkin 480V Transformer Secondary Bus)
n) 4B01.1 (Onondaga 208V Transformer Secondary Bus)
o) 4C01.1 (Hewitt 208V Transformer Secondary Bus)
p) 4C01.2 (Hewitt 480V Transformer Secondary Bus)
q) 4C02.1 (Tyler 208V Transformer Secondary Bus)
r) 4C03.1 (Seneca 208V Transformer Secondary Bus)
s) 5C01.1 (Piez 1-TN-1 480V Transformer Secondary Bus)
t) 5C01.1.2 (Piez 1-SWBDN-1 480V #1 Main Line Bus)
u) 5C01.2 (Piez L-TN-3 480V Transformer Secondary Bus)
v) 5C012.1 (Piez 1-SWBDN-1 480V #2 Main Line Bus)

continued

1.2 Results and Recommendations - continued

A Dangerous rating is quite common on a low voltage transformer's secondary bus or on the line side bus of a low voltage breaker or fused switch fed by that transformer. These busses are typically only protected by the transformer's primary device. A device placed on the medium voltage side of a low voltage secondary transformer typically cannot act quickly enough to reduce the potential arc flash hazard to a manageable level, especially for a delta primary-wye secondary transformer with a fused primary. Equipment upgrades to correct this condition require the installation of primary circuit breakers and micro-processor based programmable relaying.

Based on the amount of work that is actually necessary to be performed at these buses while they are energized, the cost of implementing such upgrades far out ways the benefits.

1. In the case of a transformer secondary compartment, there is no foreseeable reason to work on the components at this location when they are energized. Any/all work in this compartment shall require the transformer to be de-energized, locked out and grounded.

2. In the case of the line side of a breaker, the only reason to work in this compartment while it is energized is to rack the secondary main breaker in and out of its cell. In the case of a fixed mounted breaker, there is no foreseeable reason to work in this compartment while it is energized. Therefore any/all work (including racking the main breaker on or off its bus) shall be performed with the transformer de-energized; its primary locked out and grounded.

4. Interrupting capacities of all devices included in this study were found to be satisfactory – see results in section 3.

SUNY OSWEGO
RECOMMENDED TEMPORARY LOW VOLTAGE BREAKER SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	Frame/Sensor/Plug	Settings
CAMP CENT MAIN	2A01.1	981	CUTLER-HAMMER	3200.0A	LTPU (0.5-1.0 x P) 1 (2000A)
Static Trip			DS, RMS 510/610/810/910	2400.0A	LTD (2-24 Sec.) 24
			LSI, 200-5000A	2000.0A	STPU (2-10 x LTPU) 4 (8000A)
					STD (0.1-0.5 Sec.) 0.5 Sec. (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (2-12 x P) M1(8) (16000A)
CONV MAIN	3B01.1	1071	GE	1600.0A	LTPU (0.5-1.0 x P) 1 (1600A)
Static Trip			SS, SH PowerBreak II, MVT Plus/PM	1600.0A	LTD (1-4) 1
			LSI, 200-2000A Sensors	1600.0A	STPU (1.5-9 x LTPU) 4 (6400A)
					STD (Min-Max) Min (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (1.5-15 x P) 10 (16000A)
COOP MAIN	3C02.1	279	CUTLER-HAMMER	2000.0A	LTPU (0.5-1.0 x P) 0.8 (1600A)
Static Trip			DS, RMS 510/610/810/910	2000.0A	LTD (2-24 Sec.) 2
			LSI, 200-5000A	2000.0A	STPU (2-10 x LTPU) 5 (8000A)
					STD (0.1-0.5 Sec.) 0.5 Sec. (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (2-12 x P) M1(8) (16000A)
EPP-1 Fdr	1A01A.1.1	1254	CUTLER-HAMMER	800.0A	LTPU (0.5-1.0 x P) 1 (800A)
Static Trip			DS, RMS 510/610/810/910	800.0A	LTD (2-24 Sec.) 10
			LSI, 200-5000A	800.0A	STPU (2-10 x LTPU) 4 (3200A)
					STD (0.1-0.5 Sec.) 0.3 Sec. (I^2t Out)
					INST (2-12 x P) 6 (4800A)
					GFPU (100-1200A Plug) A (200A)
	RECOMMENDED TEMPORARY ONLY SETTINGS				GFD (0.1-0.5 Sec.) 0.5 Sec. (I^2t Out)
HART MAIN	3C03.1	132	CUTLER-HAMMER	1200.0A	LTPU (1.0 x P) Fixed (1200A)
Static Trip			ND, RMS 310	1200.0A	LTD (Fixed) Fixed
			LS, 400-1200A Fixed Plug	1200.0A	STPU (2-8 x LTPU) 4 (4800A)
					STD (Fixed) Fixed (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (14000A) Fixed (14000A)
LAN MAIN	3B03.1	153	CUTLER-HAMMER	2000.0A	LTPU (0.5-1.0 x P) 1 (2000A)
Static Trip			DS, RMS 510/610/810/910	2000.0A	LTD (2-24 Sec.) 20
			LSI, 200-5000A	2000.0A	STPU (2-10 x LTPU) 4 (8000A)
					STD (0.1-0.5 Sec.) 0.1 Sec. (I^2t In)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (2-12 x P) M2(12) (24000A)
RICH MAIN 1	2C03.2	1022	CUTLER-HAMMER	1200.0A	LTPU (1.0 x P) Fixed (1200A)
Static Trip			CHND, RMS 310	1200.0A	LTD (Fixed) Fixed
			LS, 400-1200A Fixed Plug	1200.0A	STPU (2-8 x P) 4 (4800A)
					STD (Fixed) Fixed (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (14000A) Fixed (14000A)

SUNY OSWEGO
RECOMMENDED TEMPORARY LOW VOLTAGE BREAKER SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	Frame/Sensor/Plug	Settings
SCALES MAIN	1B02.1	883	CUTLER-HAMMER	1200.0A	LTPU (1.0 x P) Fixed (1200A)
Static Trip			CHND, RMS 310	1200.0A	LTD (Fixed) Fixed
			LS, 400-1200A Fixed Plug	1200.0A	STPU (2-8 x P) 3 (3600A)
					STD (Fixed) Fixed (I^2t In)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (14000A) Fixed (14000A)
WALKER MAIN	1B03.1	921	CUTLER-HAMMER	1200.0A	LTPU (1.0 x P) Fixed (1200A)
Static Trip			CHND, RMS 310	1200.0A	LTD (Fixed) Fixed
			LS, 400-1200A Fixed Plug	1200.0A	STPU (2-8 x P) 3 (3600A)
					STD (Fixed) Fixed (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (14000A) Fixed (14000A)
WILBER MAIN	2A03.1	997	CUTLER-HAMMER	3200.0A	LTPU (0.5-1.0 x P) 1 (2400A)
Static Trip			DS, RMS 510/610/810/910	2400.0A	LTD (2-24 Sec.) 24
			LSI, 200-5000A	2400.0A	STPU (2-10 x LTPU) 4 (9600A)
					STD (0.1-0.5 Sec.) 0.5 Sec. (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (2-12 x P) 6 (14400A)

2.0 SYSTEM DATA

2.1 Introduction:

System Data was collected during an on-site walkthrough and from the owner. Where data was unavailable, best engineering estimates were used.

2.2 Utility Data:

The available fault current at the point of connection to the main incoming 34.5kV switches was obtained from National Grid.

Three Phase Symmetrical Fault Current (RMS) @ 34.5 kV = 6,303 Amps
SLG Symmetrical Fault Current (RMS) @ 34.5 kV = 6,204 Amps 3I0
Three Phase X/R Ratio: 7.18
Single Line to Ground X/R Ratio: 7.72

2.3 Utility Relaying:

The Utility relay settings were provided by National Grid.

Oswego Steam Station LN 207 (Breaker R205) Relays:

Phase:	Westinghouse 50/51, Type CO Tap: 6 (600A); TD: 3.9; Inst: 40 (4000A)
Neutral:	Westinghouse 50/51N, Type CO Tap: 4 (400A); TD: 3.3; Inst: 22.5 (2250A)
CT Ratio:	500:5

3.0 SHORT CIRCUIT STUDY

3.1 Objective

The short circuit study was performed for two purposes:

a. To evaluate the short circuit capabilities of the main protective devices applied at the 34.5kV, 13.2kV, and select 480V and 208V buses included in the study.

b. To provide the basic data required for determining correct fuse sizes and circuit breaker settings.

3.2 Results and recommendations

a. The power system interconnections, bus and branch number designations as used in the study, are shown on the PDC Study Model one line diagram, included under section 8.

b. Section 6 contains the computer printout of the short circuit analysis.

c. This section contains the device evaluation printout. This provides a listing of the devices included in the study, the bus at which they are applied and their short circuit ratings contrasted to the calculated short circuit duties.

The table on the following pages list each device reviewed by this study. Devices are noted as pass, fail and marginal. Based on the results of the study:

i. All devices were found to be satisfactory

SUNY OSWEGO
DEVICE EVALUATION

Device/Bus Manufacturer	Status	Description	Voltage (V) Bus/Device	Continuous Amps LF/Dev/Rating%	INT kA Calc/Dev/Series	Close-Latch kA Calc/Dev	Rating% Volt/INT/C-L	K	PartingTime Speed Cycles
M1	Pass	VCP-W	13200	0.00	2.51	3.74	88.00	1.30	3.0
0.1.1		600-3000A	15000	1200.00	20.45 (*N2)	28.80	12.25		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			12.97		Symm
M2	Pass	VCP-W	13200	0.00	2.51	3.74	88.00	1.30	3.0
0.2.1		600-3000A	15000	1200.00	20.45 (*N2)	28.80	12.25		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			12.97		Symm
M3	Pass	VCP-W	13200	0.00	3.47	5.13	88.00	1.30	3.0
0.3.1		600-3000A	15000	1200.00	20.45 (*N2)	28.80	16.96		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			17.80		Symm
CB1A	Pass	VCP-W	13200	0.00	2.41	3.39	88.00	1.30	3.0
0A		600-3000A	15000	1200.00	20.45 (*N2)	28.80	11.81		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			11.77		Symm
CB2A	Pass	VCP-W	13200	0.00	2.41	3.39	88.00	1.30	3.0
0A		600-3000A	15000	1200.00	20.45 (*N2)	28.80	11.81		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			11.77		Symm
CB5A	Pass	VCP-W	13200	0.00	2.41	3.39	88.00	1.30	3.0
0A		600-3000A	15000	1200.00	20.45 (*N2)	28.80	11.81		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			11.77		Symm
Main A	Pass	VCP-W	13200	0.00	2.41	3.39	88.00	1.30	3.0
0A		600-3000A	15000	1200.00	20.45 (*N2)	28.80	11.81		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			11.77		Symm
CB1B	Pass	VCP-W	13200	0.00	2.41	3.39	88.00	1.30	3.0
0B		600-3000A	15000	1200.00	20.45 (*N2)	28.80	11.81		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			11.77		Symm
CB2B	Pass	VCP-W	13200	0.00	2.41	3.39	88.00	1.30	3.0
0B		600-3000A	15000	1200.00	20.45 (*N2)	28.80	11.81		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			11.77		Symm

SUNY OSWEGO
DEVICE EVALUATION

Device/Bus Manufacturer	Status	Description	Voltage (V) Bus/Device	Continuous Amps LF/Dev/Rating%	INT kA Calc/Dev/Series	Close-Latch kA Calc/Dev	Rating% Volt/INT/C-L	K	PartingTime Speed Cycles
CB3B	Pass	VCP-W	13200	0.00	2.41	3.39	88.00	1.30	3.0
0B		600-3000A	15000	1200.00	20.45 (*N2)	28.80	11.81		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			11.77		Symm
CB4B	Pass	VCP-W	13200	0.00	2.41	3.39	88.00	1.30	3.0
0B		600-3000A	15000	1200.00	20.45 (*N2)	28.80	11.81		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			11.77		Symm
Main B	Pass	VCP-W	13200	0.00	2.41	3.39	88.00	1.30	3.0
0B		600-3000A	15000	1200.00	20.45 (*N2)	28.80	11.81		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			11.77		Symm
C TIE	Pass	VCP-W	13200	0.00	3.30	4.51	88.00	1.30	3.0
0C		600-3000A	15000	1200.00	20.45 (*N2)	28.80	16.13		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			15.67		Symm
CB1C	Pass	VCP-W	13200	0.00	3.30	4.51	88.00	1.30	3.0
0C		600-3000A	15000	1200.00	20.45 (*N2)	28.80	16.13		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			15.67		Symm
CB2C	Pass	VCP-W	13200	0.00	3.30	4.51	88.00	1.30	3.0
0C		600-3000A	15000	1200.00	20.45 (*N2)	28.80	16.13		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			15.67		Symm
CB3C	Pass	VCP-W	13200	0.00	3.30	4.51	88.00	1.30	3.0
0C		600-3000A	15000	1200.00	20.45 (*N2)	28.80	16.13		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			15.67		Symm
CB4C	Pass	VCP-W	13200	0.00	3.30	4.51	88.00	1.30	3.0
0C		600-3000A	15000	1200.00	20.45 (*N2)	28.80	16.13		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			15.67		Symm
CB5C	Pass	VCP-W	13200	0.00	3.30	4.51	88.00	1.30	3.0
0C		600-3000A	15000	1200.00	20.45 (*N2)	28.80	16.13		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			15.67		Symm

SUNY OSWEGO
DEVICE EVALUATION

Device/Bus Manufacturer	Status	Description	Voltage (V) Bus/Device	Continuous Amps LF/Dev/Rating%	INT kA Calc/Dev/Series	Close-Latch kA Calc/Dev	Rating% Volt/INT/C-L	K	PartingTime Speed Cycles
Main C	Pass	VCP-W	13200	0.00	3.30	4.51	88.00	1.30	3.0
0C		600-3000A	15000	1200.00	20.45 (*N2)	28.80	16.13		5.0
CUTLER-HAMMER		150 VCP-W-500		0.00			15.67		Symm
LEE-FU-1	Pass	CLE 15.5KV	13200	0.00	2.41	3.34	85.16		
1A.01A		20-80A	15500	40.00	50.00	80.00	4.81		
WESTINGHOUSE		CLE		0.00			4.18		Symm
LEE-FU-2	Pass	CLE 15.5KV	13200	0.00	2.41	3.34	85.16		
1A.01A		20-80A	15500	25.00	50.00	80.00	4.81		
WESTINGHOUSE		CLE		0.00			4.18		Symm
RIGGS-VISTA	Pass	Vista	13200	0.00	2.30	2.90	85.16		
1A.02		E-Rated, Standard Speed	15500	50.00	12.50	20.00	18.43		
S&C Vista		Vista, 50E		0.00			14.49		Symm
JOHNSON-VISTA	Pass	Vista	13200	0.00	2.28	2.81	85.16		
1A.03		E-Rated, Standard Speed	15500	80.00	12.50	20.00	18.23		
S&C Vista		Vista, 80E		0.00			14.04		Symm
SHADY VISTA	Pass	Vista	13200	0.00	2.28	2.81	85.16	1.00	3.0
1A.03		Main Fault Interrupter	15500	600.00	12500.00	20000.00	0.02		5.0
S&C		Main Fault Int.		0.00			0.01		Symm
LAKE VISTA	Pass	Vista	13200	0.00	2.26	2.76	85.16		
1A.04		E-Rated, Standard Speed	15500	50.00	12.50	20.00	18.10		
S&C Vista		Vista, 50E		0.00			13.79		Symm
LEE 480V MAIN	Pass	DS	480	0.00	10.00		100.00		
1A01A.1		AMPTECT IA	480	1600.00	50.00		20.00		
WESTINGHOUSE		DS-416		0.00					Symm
EPP-1 Fdr	Pass	DS, RMS 510/610/810/910	480	0.00	9.94		100.00		
1A01A.1.1		LSI, 200-5000A	480	800.00	30.00		33.14		
CUTLER-HAMMER		DS-206		0.00					Symm

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DEVICE EVALUATION

Device/Bus Manufacturer	Status	Description	Voltage (V) Bus/Device	Continuous Amps LF/Dev/Rating%	INT kA Calc/Dev/Series	Close-Latch kA Calc/Dev	Rating% Volt/INT/C-L	K	PartingTime Speed Cycles
EPL-1 Fdr	Pass	HKD	480	0.00	8.84		100.00		
1A01A.1.4		100-400A	480	400.00	65.00		13.60		
CUTLER-HAMMER		HKD		0.00					Symm
PP-4 Fdr	Pass	HKD	480	0.00	8.84		100.00		
1A01A.1.4		100-400A	480	400.00	65.00		13.60		
CUTLER-HAMMER		HKD		0.00					Symm
LEE 208V MAIN	Unknown (No Lib)		208	*0.00	*14.45				
1A01A.2	**DATA UNAVAILABLE AT TIME OF STUDY**								
EPL-1 Main	Pass	MDLB	208	0.00	8.43		86.67		
1A01A1.4.3		300-800A	240	800.00	65.00		12.98		
CUTLER-HAMMER		MDLB		0.00					Symm
RIGGS MAIN	Pass	CHND, RMS 310	208	0.00	21.05		86.67		
1A02.1		LS, 400-1200A Fixed Plug	240	1200.00	100.00		21.05		
CUTLER-HAMMER		CHND		0.00					Symm
JOHNS-MAIN	Pass	Magnum DS, RMS 520	208	0.00	37.46		43.33		
1A03.1		LSI, 4000AF, 3200-4000A Plugs	480	4000.00	85.00		44.07		
CUTLER-HAMMER		MDS-840		0.00					Symm
LAKE MAIN	Pass	CHND, RMS 310	208	0.00	24.59		86.67		
1A04.1		LSI, 400-1200A Fixed Plug	240	1200.00	100.00		24.59		
CUTLER-HAMMER		CHND		0.00					Symm
WATER-VISTA	Pass	Vista	13200	0.00	2.30	2.89	85.16		
1B.01		E-Rated, Standard Speed	15500	25.00	12.50	20.00	18.42		
S&C Vista		Vista, 25E		0.00			14.46		Symm
SCALES-VISTA	Pass	Vista	13200	0.00	2.25	2.73	85.16		
1B.02		E-Rated, Standard Speed	15500	25.00	12.50	20.00	18.03		
S&C Vista		Vista, 25E		0.00			13.64		Symm

SUNY OSWEGO
DEVICE EVALUATION

Device/Bus Manufacturer	Status	Description	Voltage (V) Bus/Device	Continuous Amps LF/Dev/Rating%	INT kA Calc/Dev/Series	Close-Latch kA Calc/Dev	Rating% Volt/INT/C-L	K	PartingTime Speed Cycles
WALKER-VISTA	Pass	Vista	13200	0.00	2.23	2.67	85.16		
1B.03		E-Rated, Standard Speed	15500	25.00	12.50	20.00	17.88		
S&C Vista		Vista, 25E		0.00			13.37		Symm
WATER MAIN	Unknown (No Lib)		208	*0.00	*10.44				
1B01.1	**DATA UNAVAILABLE AT TIME OF STUDY**								
SCALES MAIN	Pass	CHND, RMS 310	208	0.00	10.46		86.67		
1B02.1		LS, 400-1200A Fixed Plug	240	1200.00	100.00		10.46		
CUTLER-HAMMER		CHND		0.00					Symm
WALKER MAIN	Pass	CHND, RMS 310	208	0.00	10.47		86.67		
1B03.1		LS, 400-1200A Fixed Plug	240	1200.00	100.00		10.47		
CUTLER-HAMMER		CHND		0.00					Symm
SWETMAN-VISTA	Pass	Vista	13200	0.00	2.34	3.05	85.16		
2A.01		E-Rated, Standard Speed	15500	65.00	12.50	20.00	18.75		
S&C Vista		Vista, 65E		0.00			15.26		Symm
SNYGG-VISTA	Pass	Vista	13200	0.00	2.29	2.83	85.16		
2A.02		E-Rated, Standard Speed	15500	80.00	12.50	20.00	18.28		
S&C Vista		Vista, 80E		0.00			14.16		Symm
WILBER-VISTA	Pass	Vista	13200	0.00	2.25	2.73	85.16		
2A.03		E-Rated, Standard Speed	15500	65.00	12.50	20.00	18.03		
S&C Vista		Vista, 65E		0.00			13.66		Symm
CAMP CENT MAIN	Pass	DS, RMS 510/610/810/910	208	0.00	31.30 (*N1)		86.67		
2A01.1		LSI, 200-5000A	240	2000.00	85.00		36.82		
CUTLER-HAMMER		DS-632		0.00					Symm
SNYGG FU	Unknown (No Lib)		208	*0.00	*39.51				
2A02.1	**DATA UNAVAILABLE AT TIME OF STUDY**								

SUNY OSWEGO
DEVICE EVALUATION

Device/Bus Manufacturer	Status	Description	Voltage (V) Bus/Device	Continuous Amps LF/Dev/Rating%	INT kA Calc/Dev/Series	Close-Latch kA Calc/Dev	Rating% Volt/INT/C-L	K	PartingTime Speed Cycles
WILBER MAIN	Pass	DS, RMS 510/610/810/910	208	0.00	30.92 (*N1)		86.67		
2A03.1		LSI, 200-5000A	240	2400.00	85.00		36.37		
CUTLER-HAMMER		DS-632		0.00					Symm
SERV B-VISTA	Pass	Vista	13200	0.00	3.07	3.66	85.16		
2C.01		E-Rated, Standard Speed	15500	25.00	12.50	20.00	24.59		
S&C Vista		Vista, 25E		0.00			18.31		Symm
MACKIN-VISTA	Pass	Vista	13200	0.00	3.03	3.55	85.16		
2C.02		E-Rated, Standard Speed	15500	30.00	12.50	20.00	24.28		
S&C Vista		Vista, 30E		0.00			17.77		Symm
RICH-VISTA-1	Pass	Vista	13200	0.00	2.98	3.43	85.16		
2C.03		E-Rated, Standard Speed	15500	30.00	12.50	20.00	23.88		
S&C Vista		Vista, 30E		0.00			17.16		Symm
RICH-VISTA-2	Pass	Vista	13200	0.00	2.98	3.43	85.16		
2C.03		E-Rated, Standard Speed	15500	50.00	12.50	20.00	23.88		
S&C Vista		Vista, 50E		0.00			17.16		Symm
SERV MAIN	Pass	DK	208	0.00	5.83		86.67		
2C01.1		250-400A	240	400.00	65.00		8.97		
CUTLER-HAMMER		DK		0.00					Symm
MAC MAIN	Pass	DS DIGITRP	208	0.00	14.46		86.67		
2C02.1		LSI 100-4K	240	1200.00	65.00		22.25		
WESTINGHOUSE		DS-420		0.00					Symm
RICH MAIN 2	Pass	RL, Static Trip III	480	0.00	10.01		100.00		
2C03.1		LSI, 150-5000A	480	1600.00	65.00		15.40		
SIEMENS		RL-1600		0.00					Symm
RICH MAIN 1	Pass	CHND, RMS 310	208	0.00	14.53		43.33		
2C03.2		LS, 400-1200A Fixed Plug	480	1200.00	65.00		22.35		
CUTLER-HAMMER		CHND		0.00					Symm

SUNY OSWEGO
DEVICE EVALUATION

Device/Bus Manufacturer	Status	Description	Voltage (V) Bus/Device	Continuous Amps LF/Dev/Rating%	INT kA Calc/Dev/Series	Close-Latch kA Calc/Dev	Rating% Volt/INT/C-L	K	PartingTime Speed Cycles
PARK MAIN	Pass	DS, RMS 510/610/810/910	208	0.00	31.16		86.67		
2C04.1		LSI, 200-5000A	240	2400.00	85.00		36.66		
CUTLER-HAMMER		DS-632		0.00					Symm
CONVO-VISTA	Pass	Vista	13200	0.00	2.29	2.86	85.16		
3B.01		E-Rated, Standard Speed	15500	80.00	12.50	20.00	18.35		
S&C Vista		Vista, 80E		0.00			14.30		Symm
LAN-VISTA	Pass	Vista	13200	0.00	2.26	2.75	85.16		
3B.03		E-Rated, Standard Speed	15500	80.00	12.50	20.00	18.08		
S&C Vista		Vista, 80E		0.00			13.74		Symm
MAHAR-VISTA	Pass	Vista	13200	0.00	2.21	2.60	85.16		
3B.04		E-Rated, Standard Speed	15500	65.00	12.50	20.00	17.67		
S&C Vista		Vista, 65E		0.00			13.00		Symm
CONV MAIN	Pass	SS, SH PowerBreak II, MVT Plus/PM	480	0.00	18.65 (*N1)		100.00		
3B01.1		LSI, 200-2000A Sensors	480	1600.00	65.00		28.69		
GE		SS		0.00					Symm
PEN MAIN	Pass	DS, RMS 510/610/810/910	480	0.00	32.34 (*N1)		100.00		
3B02.1		LSI, 200-5000A	480	3200.00	65.00		49.75		
CUTLER-HAMMER		DS-632		0.00					Symm
LAN MAIN	Pass	DS, RMS 510/610/810/910	208	0.00	43.22 (*N1)		43.33		
3B03.1		LSI, 200-5000A	480	2000.00	65.00		66.49		
CUTLER-HAMMER		DS-420		0.00					Symm
MAHAR MAIN	Pass	DS, RMS 510/610/810/910	208	0.00	33.00		86.67		
3B04.1		LSI, 200-5000A	240	2000.00	65.00		50.77		
CUTLER-HAMMER		DS-4200		0.00					Symm
FUNNELLE-VISTA	Pass	Vista	13200	0.00	3.07	3.65	85.16		
3C.01		E-Rated, Standard Speed	15500	30.00	12.50	20.00	24.55		
S&C Vista		Vista, 30E		0.00			18.24		Symm

SUNY OSWEGO
DEVICE EVALUATION

Device/Bus Manufacturer	Status	Description	Voltage (V) Bus/Device	Continuous Amps LF/Dev/Rating%	INT kA Calc/Dev/Series	Close-Latch kA Calc/Dev	Rating% Volt/INT/C-L	K	PartingTime Speed Cycles
COOPER-VISTA	Pass	Vista	13200	0.00	2.98	3.41	85.16		
3C.02		E-Rated, Standard Speed	15500	50.00	12.50	20.00	23.80		
S&C Vista		Vista, 50E		0.00			17.04		Symm
HART-VISTA	Pass	Vista	13200	0.00	2.95	3.35	85.16		
3C.03		E-Rated, Standard Speed	15500	30.00	12.50	20.00	23.60		
S&C Vista		Vista, 30E		0.00			16.76		Symm
CULKIN-VISTA	Pass	Vista	13200	0.00	2.85	3.15	85.16		
3C.04		E-Rated, Standard Speed	15500	125.00	12.50	20.00	22.80		
S&C Vista		Vista, 125E		0.00			15.73		Symm
FUNN MAIN	Unknown (No Lib)		208	*0.00	*14.34				
3C01.1	**DATA UNAVAILABLE AT TIME OF STUDY**								
COOP MAIN	Pass	DS, RMS 510/610/810/910	208	0.00	23.37		86.67		
3C02.1		LSI, 200-5000A	240	2000.00	65.00		35.95		
CUTLER-HAMMER		DS-4200		0.00					Symm
HART MAIN	Pass	ND, RMS 310	208	0.00	14.49		86.67		
3C03.1		LS, 400-1200A Fixed Plug	240	1200.00	65.00		22.30		
CUTLER-HAMMER		ND		0.00					Symm
CULK MAIN	Pass	DS, RMS 510/610/810/910	480	0.00	33.47 (*N1)		100.00		
3C04.1		LS, 200-5000A	480	3200.00	65.00		51.50		
CUTLER-HAMMER		DS-632		0.00					Symm
ONON-VISTA	Pass	Vista	13200	0.00	2.18	2.52	85.16		
4B.01		E-Rated, Standard Speed	15500	65.00	12.50	20.00	17.41		
S&C Vista		Vista, 65E		0.00			12.59		Symm
ONEIDA-VISTA	Pass	Vista	13200	0.00	2.13	2.42	85.16		
4B.02		E-Rated, Standard Speed	15500	30.00	12.50	20.00	17.07		
S&C Vista		Vista, 30E		0.00			12.10		Symm

SUNY OSWEGO
DEVICE EVALUATION

Device/Bus Manufacturer	Status	Description	Voltage (V) Bus/Device	Continuous Amps LF/Dev/Rating%	INT kA Calc/Dev/Series	Close-Latch kA Calc/Dev	Rating% Volt/INT/C-L	K	PartingTime Speed Cycles
To TOWNHOUSES	Unknown (No Lib)		13200	*0.00	*2.13				
4B.02	**DATA UNAVAILABLE AT TIME OF STUDY**								
L PAGE-VISTA	Pass	Vista	13200	0.00	2.11	2.37	85.16		
4B.04		E-Rated, Standard Speed	15500	30.00	12.50	20.00	16.89		
S&C Vista		Vista, 30E		0.00			11.85		Symm
CAYUGA-VISTA	Pass	Vista	13200	0.00	2.08	2.30	85.16		
4B.05		E-Rated, Standard Speed	15500	30.00	12.50	20.00	16.62		
S&C Vista		Vista, 30E		0.00			11.51		Symm
ONON FU	Pass	A4BY, 600V Class L	208	0.00	32.93		34.67		
4B01.1		200-6000A	600	2500.00	200.00		16.46		
GOULD SHAWMUT		A4BY		0.00					Symm
ONEIDA MAIN	Pass	DS, RMS 510/610/810/910	208	0.00	14.54		86.67		
4B02.1		LSI, 200-5000A	240	1200.00	65.00		22.36		
CUTLER-HAMMER		DS-416H		0.00					Symm
LP MAIN	Pass	DS, RMS 510/610/810/910	208	0.00	14.53		86.67		
4B04.1		LSI, 200-5000A	240	1200.00	65.00		22.35		
CUTLER-HAMMER		DS-416H		0.00					Symm
CAYUGA SM	Pass	DS, RMS 510/610/810/910	208	0.00	14.51		86.67		
4B05.1		LSI, 200-5000A	240	1600.00	65.00		22.32		
CUTLER-HAMMER		DS-416H		0.00					Symm
HEW-VISTA 1	Pass	Vista	13200	0.00	3.06	3.62	85.16		
4C.01.0		E-Rated, Standard Speed	15500	80.00	12.50	20.00	24.48		
S&C Vista		Vista, 80E		0.00			18.12		Symm
HEW-VISTA 2	Pass	Vista	13200	0.00	3.06	3.62	85.16		
4C.01.0		E-Rated, Standard Speed	15500	65.00	12.50	20.00	24.48		
S&C Vista		Vista, 65E		0.00			18.12		Symm

SUNY OSWEGO
DEVICE EVALUATION

Device/Bus Manufacturer	Status	Description	Voltage (V) Bus/Device	Continuous Amps LF/Dev/Rating%	INT kA Calc/Dev/Series	Close-Latch kA Calc/Dev	Rating% Volt/INT/C-L	K	PartingTime Speed Cycles
TY-1-VISTA	Pass	Vista	13200	0.00	3.00	3.46	85.16		
4C.02		E-Rated, Standard Speed	15500	80.00	12.50	20.00	23.96		
S&C Vista		Vista, 80E		0.00			17.28		Symm
TY-2-VISTA	Pass	Vista	13200	0.00	3.00	3.46	85.16		
4C.02		E-Rated, Standard Speed	15500	25.00	12.50	20.00	23.96		
S&C Vista		Vista, 25E		0.00			17.28		Symm
SEN-VISTA	Pass	Vista	13200	0.00	2.92	3.29	85.16		
4C.03		E-Rated, Standard Speed	15500	65.00	12.50	20.00	23.39		
S&C Vista		Vista, 65E		0.00			16.46		Symm
PATH-VISTA	Pass	Vista	13200	0.00	2.91	3.27	85.16		
4C.04		E-Rated, Standard Speed	15500	30.00	12.50	20.00	23.31		
S&C Vista		Vista, 30E		0.00			16.36		Symm
HEW-1 SM	Pass	DS, RMS 510/610/810/910	208	0.00	45.48 (*N1)		86.67		
4C01.1		LSI, 200-5000A	240	3200.00	85.00		53.50		
CUTLER-HAMMER		DS-632		0.00					Symm
HEW 2 MAIN	Pass	MDL	480	0.00	10.38		100.00		
4C01.2		300-800A	480	800.00	50.00		20.75		
CUTLER-HAMMER		MDL		0.00					Symm
TY-1 MAIN	Pass	DS, RMS 510/610/810/910	208	0.00	45.10 (*N1)		86.67		
4C02.1		LSI, 200-5000A	240	3200.00	85.00		53.06		
CUTLER-HAMMER		DS-632		0.00					Symm
TY-2 MAIN	Pass	HFD	480	0.00	4.89		100.00		
4C02.2		15-225A	480	225.00	65.00		7.52		
CUTLER-HAMMER		HFD		0.00					Symm
SEN MAIN	Pass	DS, RMS 510/610/810/910	208	0.00	34.33		86.67		
4C03.1		LSI, 200-5000A	240	2000.00	65.00		52.82		
CUTLER-HAMMER		DS-4200		0.00					Symm

SUNY OSWEGO
DEVICE EVALUATION

Device/Bus Manufacturer	Status	Description	Voltage (V) Bus/Device	Continuous Amps LF/Dev/Rating%	INT kA Calc/Dev/Series	Close-Latch kA Calc/Dev	Rating% Volt/INT/C-L	K	PartingTime Speed Cycles
PATH MAIN	Pass	DS, RMS 510/610/810/910	208	0.00	14.82		86.67		
4C04.1		LSI, 200-5000A	240	1200.00	65.00		22.80		
CUTLER-HAMMER		DS-416H		0.00					Symm
PIEZ 1 MAIN	Pass	Magnum SB, DT 520	480	0.00	25.43		94.49		
5C01.1.2		LSI, 3000AF, 200-3000AP	508	3000.00	65.00		39.13		
CUTLER-HAMMER		SBS-630		0.00					Symm
PIEZ 2 MAIN	Pass	Magnum SB, DT 520	480	0.00	37.72 (*N1)		94.49		
5C012.1		LSI, 5000A DWF, 2500-5000AP	508	5000.00	100.00		37.72		
CUTLER-HAMMER		SBS-C50		0.00					Symm
Standby Bkr	Pass	MXD6 Sentron	480	0.00	4.78 (*N1)		100.00		
G01.1		500-800A	480	800.00	50.00		9.56		
SIEMENS		MXD6		0.00					Symm
Load Bank Bkr	Pass	MXD6 Sentron	480	0.00	4.78 (*N1)		100.00		
G01.2		500-800A	480	800.00	50.00		9.56		
SIEMENS		MXD6		0.00					Symm
(*N1) System X/R higher than Test X/R, Calc INT kA modified based on low voltage factor.									
(*N2) Dev Isc kA modified based on Max Rating Voltage and K Factor.									
(*Device Voltage) Device did not pass. Device is either Marginal (100%) or Failed (100%) of the device voltage rating.									
(*LF Amps) Device did not pass. Device is either Marginal (90%) or Failed (100%) of the continuous current ampacity.									
(*Calc INT kA) Device did not pass. Device is either Marginal (90%) or Failed (100%) of the device library interrupting rating.									

4.0 PROTECTIVE DEVICE COORDINATION STUDY

4.1 Objective:

The coordination Study was performed to determine the proper sizes, ratings and settings of protective devices to achieve optimum protection and selectivity in the system under study. This was accomplished by starting at the main incoming utility device, and ending with each device as identified on the study one-lines.

4.2 Coordination Curves:

a. The coordination curves are listed in this section following the commentary. Each curve is accompanied by its TCC report and protective device calculation sheets.

b. The coordination curves are plotted on log-log paper as operating time versus current magnitude to show protective device characteristics and coordination among protective devices.

c. Consideration was given to both selective isolation of faults and maximum protection of equipment such as cables and transformers. The minimum protection requirements of this equipment are outlined in the NEC, ANSI and IEEE Standards.

d. The fault currents shown on the curves were derived from the Short Circuit Study.

e. All devices were selected or set to achieve optimum protection and selectivity except as noted in “f” below.

f. In some cases optimum selectivity may be sacrificed to lower the arc flash incident energy. If this is the case, it will be noted in the device setting sheets in this section.

SUNY OSWEGO
RECOMMENDED RELAY SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	INST Delay (A)	Settings	Test Points
1A-50/51	0A	49	MULTILIN	200 / 5	Phase	2.0X / 5.233s
Electronic			SR750/760 Feeder Relay		OC Pickup 1.25 (250A)	5.0X / 0.742s
			5A CT Sec		Ext Inverse 3; 1 (S;M)	10.0X / 0.295s
					GF	
					OC Pickup 1 (50A)	
					Mod Inverse 0.7; 1 (S;M)	
1B-50/51	0B	30	MULTILIN	200 / 5	Phase	2.0X / 5.233s
Electronic			SR750/760 Feeder Relay		OC Pickup 1.25 (250A)	5.0X / 0.742s
			5A CT Sec		Ext Inverse 3; 1 (S;M)	10.0X / 0.295s
					GF	
					OC Pickup 1 (50A)	
					Mod Inverse 0.7; 1 (S;M)	
1C-50/51	0C	1037	SEL	400 / 5	Phase	2.0X / 4.169s
Electronic			751A		51P1P, (0.5-16 x CTR) 6 (480A)	5.0X / 0.774s
			50P/51P, 5A nom.		U3, Very Inverse 3.0	10.0X / 0.406s
					50P1P, (0.5-100 x CTR) 10 (800A)	
					50P1D, (0.001 - 5s) 0.001	
					GF	
					51N1P, (0.5-16 x CTR) 6 (60A)	
					U3, Very Inverse 3.0	
					50N1P, (0.5-100 x CTR) 10 (100A)	
					50N1D, (0.001 - 5s) 0.001	
2A-50/51	0A	49	MULTILIN	200 / 5	Phase	2.0X / 5.233s
Electronic			SR750/760 Feeder Relay		OC Pickup 1.25 (250A)	5.0X / 0.742s
			5A CT Sec		Ext Inverse 3; 1 (S;M)	10.0X / 0.295s
					GF	
					OC Pickup 1 (50A)	
					Mod Inverse 0.7; 1 (S;M)	
2B-50/51	0B	30	MULTILIN	200 / 5	Phase	2.0X / 5.233s
Electronic			SR750/760 Feeder Relay		OC Pickup 1.25 (250A)	5.0X / 0.742s
			5A CT Sec		Ext Inverse 3; 1 (S;M)	10.0X / 0.295s
					GF	
					OC Pickup 1 (50A)	
					Ext Inverse 3.1; 1 (S;M)	
2C-50/51	0C	1037	SEL	400 / 5	Phase	2.0X / 6.353s
Electronic			751A		51P1P, (0.5-16 x CTR) 3.1 (248A)	5.0X / 0.896s
			50P/51P, 5A nom.		U4, Extremely Inverse 3.3	10.0X / 0.305s
					GF	
					51N1P, (0.5-16 x CTR) 5 (50A)	
					U1, Moderately Inverse 0.7	

SUNY OSWEGO
RECOMMENDED RELAY SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	INST Delay (A)	Settings	Test Points
3B-50/51	0B	30	MULTILIN	200 / 5	Phase	2.0X / 5.233s
Electronic			SR750/760 Feeder Relay		OC Pickup 1.25 (250A)	5.0X / 0.742s
			5A CT Sec		Ext Inverse 3; 1 (S;M)	10.0X / 0.295s
					GF	
					OC Pickup 1 (50A)	
					Mod Inverse 0.7; 1 (S;M)	
3C-50/51	0C	1037	SEL	400 / 5	Phase	2.0X / 6.353s
Electronic			751A		51P1P, (0.5-16 x CTR) 3.1 (248A)	5.0X / 0.896s
			50P/51P, 5A nom.		U4, Extremely Inverse 3.3	10.0X / 0.305s
					GF	
					51N1P, (0.5-16 x CTR) 5 (50A)	
					U1, Moderately Inverse 0.7	
4B-50/51	0B	30	MULTILIN	200 / 5	Phase	2.0X / 5.233s
Electronic			SR750/760 Feeder Relay		OC Pickup 1.25 (250A)	5.0X / 0.742s
			5A CT Sec		Ext Inverse 3; 1 (S;M)	10.0X / 0.295s
					GF	
					OC Pickup 1 (50A)	
					Mod Inverse 0.7; 1 (S;M)	
4C-50/51	0C	1037	SEL	400 / 5	Phase	2.0X / 6.353s
Electronic			751A		51P1P, (0.5-16 x CTR) 3.1 (248A)	5.0X / 0.896s
			50P/51P, 5A nom.		U4, Extremely Inverse 3.3	10.0X / 0.305s
					GF	
					51N1P, (0.5-16 x CTR) 5 (50A)	
					U1, Moderately Inverse 0.7	
5A-50/51	0A	49	MULTILIN	200 / 5	Phase	2.0X / 1.988s
Electronic			SR750/760 Feeder Relay		OC Pickup 1.7 (340A)	5.0X / 0.390s
			5A CT Sec		Very Inverse 1.5; 1 (S;M)	10.0X / 0.218s
					GF	
					OC Pickup 1 (50A)	
					Mod Inverse 0.7; 1 (S;M)	
5C-50/51	0C	1037	SEL	400 / 5	Phase	2.0X / 2.223s
Electronic			751A		51P1P, (0.5-16 x CTR) 4.3 (344A)	5.0X / 0.413s
			50P/51P, 5A nom.		U3, Very Inverse 1.6	10.0X / 0.217s
					GF	
					51N1P, (0.5-16 x CTR) 5 (50A)	
					U1, Moderately Inverse 0.7	

SUNY OSWEGO
RECOMMENDED RELAY SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	INST Delay (A)	Settings	Test Points
BUS A 50/51	0A	49	MULTILIN	1200 / 5	Phase	2.0X / 3.838s
Electronic			SR750/760 Feeder Relay		OC Pickup 0.43 (516A)	5.0X / 0.544s
			5A CT Sec		Ext Inverse 2.2; 1 (S;M)	10.0X / 0.216s
					GF	
					OC Pickup 0.1 (120A)	
					Mod Inverse 1.2; 1 (S;M)	
BUS B 50/51	0B	30	MULTILIN	1200 / 5	Phase	2.0X / 3.838s
Electronic			SR750/760 Feeder Relay		OC Pickup 0.43 (516A)	5.0X / 0.544s
			5A CT Sec		Ext Inverse 2.2; 1 (S;M)	10.0X / 0.216s
					GF	
					OC Pickup 0.1 (120A)	
					Mod Inverse 1.2; 1 (S;M)	
BUS C 50/51	0C	1037	SEL	600 / 5	Phase	2.0X / 3.335s
Electronic			351-0, -1, -2, -3, -4		51PP 4.8 (576A)	5.0X / 0.619s
			50P/51P, 5A nom.		U3, Very Inv 2.4	10.0X / 0.325s
					GF	
					51NP 0.7 (84A)	
					U1, Mod Inv 1.4	
NMPC 50/51	0.000	2	WESTINGHOUSE	500 / 5	Tap 6.0 (600A)	2.0X / 1.663s
Electro-Mechanical			CO-6		Time Dials 3.9	5.0X / 0.952s
			50/51		INST (High) 40 (4000A)	10.0X / 0.852s
NMPC 50/51G	0.000	2	WESTINGHOUSE	500 / 5	Tap 4.0 (400A)	2.0X / 1.441s
Electro-Mechanical			CO-6		Time Dials 3.3	5.0X / 0.817s
			50/51		INST (High) 22.5 (2250A)	10.0X / 0.744s
T1 50/51	0.1.1	1104	MULTILIN	1200 / 5	Phase	2.0X / 5.756s
Electronic			SR750/760 Feeder Relay		OC Pickup 0.43 (516A)	5.0X / 0.816s
			5A CT Sec		Ext Inverse 3.3; 1 (S;M)	10.0X / 0.324s
					GF	
					OC Pickup 0.4 (80A)	
					Mod Inverse 1.6; 1 (S;M)	
T1 P-50/51	0.000	2	MULTILIN	400 / 5	Phase	2.0X / 4.414s
Electronic			SR745 Xfmr Relay		OC Pickup 0.6 (240A)	5.0X / 1.017s
			5A CT Sec		Norm Inverse 2.5; 1 (S;M)	10.0X / 0.565s
					Inst OC Pickup 4.1 (1640A)	
					GF	
					OC Pickup 0.2 (80A)	
					Mod Inverse 1; 1 (S;M)	
					Inst OC Pickup 4 (1600A)	

SUNY OSWEGO
RECOMMENDED RELAY SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	INST Delay (A)	Settings	Test Points
T1 P-50/51 BU	0.000	2	MULTILIN	400 / 5	Phase	2.0X / 4.414s
Electronic			SR735/737 Feeder Relay		Pickup(Lo) 60 % (240A)	5.0X / 1.017s
			5A CT Sec		NORM INV 0.5; 5 (S;M)	0.0
					INST 5.0 (2000A)	
					GF	
					Pickup(Lo) 20 % (80A)	
					MOD INV 1; 1 (S;M)	
					INST 4.0 (1600A)	
T1-87T	0.000	2	BASLER	Primary:	Primary Tap (Input 1) 3.0	
Electronic			BE1-87T	1200 / 5 (400 / 5)	Secondary Tap (Input 2) 4.5	
			5A CT Sec	Secondary:	Unrestrained Pickup N (18X)	
				1200 / 5	Restrained Pickup D (30%)	
T2 P-50/51	0.000	2	MULTILIN	400 / 5	Phase	2.0X / 4.414s
Electronic			SR745 Xfmr Relay		OC Pickup 0.6 (240A)	5.0X / 1.017s
			5A CT Sec		Norm Inverse 2.5; 1 (S;M)	10.0X / 0.565s
					Inst OC Pickup 4.1 (1640A)	
					GF	
					OC Pickup 0.2 (80A)	
					Mod Inverse 1; 1 (S;M)	
					Inst OC Pickup 4 (1600A)	
T2 P-50/51 BU	0.000	2	MULTILIN	400 / 5	Phase	2.0X / 4.414s
Electronic			SR735/737 Feeder Relay		Pickup(Lo) 60 % (240A)	5.0X / 1.017s
			5A CT Sec		NORM INV 0.5; 5 (S;M)	0.0
					INST 5.0 (2000A)	
					GF	
					Pickup(Lo) 20 % (80A)	
					MOD INV 1; 1 (S;M)	
					INST 4.0 (1600A)	
T2-50/51	0.2.1	1114	MULTILIN	1200 / 5	Phase	2.0X / 5.756s
Electronic			SR750/760 Feeder Relay		OC Pickup 0.43 (516A)	5.0X / 0.816s
			5A CT Sec		Ext Inverse 3.3; 1 (S;M)	10.0X / 0.324s
					GF	
					OC Pickup 0.4 (80A)	
					Mod Inverse 1.6; 1 (S;M)	
T2-87T	0.000	2	BASLER	Primary:	Primary Tap (Input 1) 3.0	
Electronic			BE1-87T	1200 / 5 (400 / 5)	Secondary Tap (Input 2) 4.5	
			5A CT Sec	Secondary:	Unrestrained Pickup N (18X)	
				1200 / 5	Restrained Pickup D (30%)	

SUNY OSWEGO
RECOMMENDED RELAY SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	INST Delay (A)	Settings	Test Points
T3 -51	0.3.1	1119	SEL	600 / 5	Phase	2.0X / 4.543s
Electronic			551		51P1P/51P2P 4.8 (576A)	5.0X / 0.899s
			50P/51P, 5A Rated		U2, Inverse 2.1	10.0X / 0.504s
					GF	
					51N1P 0.7 (84A)	
					U1, Mod Inv 2.2	
T3 51N	0.3.1	1119	SEL	200 / 5	51NnP 2 (80A)	2.0X / 1.766s
Electronic			387		U1, Mod Inv 2.3	5.0X / 0.783s
			50N/51N, 5A Rated			10.0X / 0.560s
T3 P-50/51	0.000	2	MULTILIN	400 / 5	Phase	2.0X / 4.944s
Electronic			SR750/760 Feeder Relay		OC Pickup 0.6 (240A)	5.0X / 1.139s
			5A CT Sec		Norm Inverse 2.8; 1 (S;M)	10.0X / 0.633s
					Inst OC Pickup 5.7 (2280A)	
					GF	
					OC Pickup 0.2 (80A)	
					Mod Inverse 1; 1 (S;M)	
					Inst OC Pickup 4 (1600A)	
T3 P-50/51 BU	0.000	2	SEL	400 / 5	Phase	2.0X / 5.841s
Electronic			501-2		51PP 3 (240A)	5.0X / 1.155s
			50P/51P, 5A Rated		U2, Inverse 2.7	0.0
					50PP 28.5 (2280A)	
					GF	
					51G1P 1 (80A)	
					U1, Mod Inv 1	
					50G1P/50G2P 20 (1600A)	
T3-87T	0.000	2	SEL	Primary:	Primary (Tap 1) 2.20	
Electronic			387	400 / 5	Secondary (Tap 2) 3.83	
			87T, 5A Rated	Secondary:	Restraining Element (O87P) 0.3	
				1200 / 5 (600 / 5)	Slope 1 0.3	
					Slope 2 OFF	
					IRS1 N/A	
					Unrestrained Element (U87P) 9X	

SUNY OSWEGO
RECOMMENDED FUSE SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	Cartridge/Trip	Settings
CAYUGA-VISTA	4B.05	191	S&C Vista	30.0A	30 Amps
High Voltage			Vista	30.0A	
			E-Rated, Standard Speed		
CONVO-VISTA	3B.01	1067	S&C Vista	80.0A	80 Amps
High Voltage			Vista	80.0A	
			E-Rated, Standard Speed		
COOPER-VISTA	3C.02	117	S&C Vista	50.0A	50 Amps
High Voltage			Vista	50.0A	
			E-Rated, Standard Speed		
CULKIN-VISTA	3C.04	134	S&C Vista	125.0A	125 Amps
High Voltage			Vista	125.0A	
			E-Rated, Standard Speed		
FUNNELLE-VISTA	3C.01	52	S&C Vista	30.0A	30 Amps
High Voltage			Vista	30.0A	
			E-Rated, Standard Speed		
HART-VISTA	3C.03	120	S&C Vista	30.0A	30 Amps
High Voltage			Vista	30.0A	
			E-Rated, Standard Speed		
HEW-VISTA 1	4C.01.0	1085	S&C Vista	80.0A	80 Amps
High Voltage			Vista	80.0A	
			E-Rated, Standard Speed		
HEW-VISTA 2	4C.01.0	1085	S&C Vista	65.0A	65 Amps
High Voltage			Vista	65.0A	
			E-Rated, Standard Speed		
JOHNSON-VISTA	1A.03	946	S&C Vista	80.0A	80 Amps
High Voltage			Vista	80.0A	
			E-Rated, Standard Speed		
L PAGE-VISTA	4B.04	182	S&C Vista	30.0A	30 Amps
High Voltage			Vista	30.0A	
			E-Rated, Standard Speed		

SUNY OSWEGO
RECOMMENDED FUSE SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	Cartridge/Trip	Settings
LAKE VISTA	1A.04	958	S&C Vista	50.0A	Phase
High Voltage			Vista	50.0A	50 Amps
			E-Rated, Standard Speed		GF
					50A
LAN-VISTA	3B.03	146	S&C Vista	80.0A	80 Amps
High Voltage			Vista	80.0A	
			E-Rated, Standard Speed		
LEE-FU-1	1A.01A	1227	WESTINGHOUSE	40.0A	Phase
High Voltage			CLE 15.5KV	40.0A	Opening Clearing Curve
			20-80A		GF
					50A
LEE-FU-2	1A.01A	1227	WESTINGHOUSE	25.0A	Phase
High Voltage			CLE 15.5KV	25.0A	Opening Clearing Curve
			20-80A		GF
					50A
MACKIN-VISTA	2C.02	1010	S&C Vista	30.0A	30 Amps
High Voltage			Vista	30.0A	
			E-Rated, Standard Speed		
MAHAR-VISTA	3B.04	155	S&C Vista	65.0A	Phase
High Voltage			Vista	65.0A	65 Amps
			E-Rated, Standard Speed		GF
					50A
ONEIDA-VISTA	4B.02	173	S&C Vista	30.0A	30 Amps
High Voltage			Vista	30.0A	
			E-Rated, Standard Speed		
ONON FU	4B01.1	171	GOULD SHAWMUT	2500.0A	0.0
Low Voltage			A4BY, 600V Class L	2500.0A	0.0
			200-6000A		0.0
ONON-VISTA	4B.01	47	S&C Vista	65.0A	65 Amps
High Voltage			Vista	65.0A	
			E-Rated, Standard Speed		

SUNY OSWEGO
RECOMMENDED FUSE SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	Cartridge/Trip	Settings
PATH-VISTA	4C.04	95	S&C Vista	30.0A	30 Amps
High Voltage			Vista	30.0A	
			E-Rated, Standard Speed		
PEN VISTA	3B.02	48	S&C Vista	125.0A	Phase
High Voltage			Vista	125.0A	125 Amps
			E-Rated, Standard Speed		GF
					50A
RICH-VISTA-1	2C.03	1018	S&C Vista	30.0A	Phase
High Voltage			Vista	30.0A	30 Amps
			E-Rated, Standard Speed		GF
					50A
RICH-VISTA-2	2C.03	1018	S&C Vista	50.0A	50 Amps
High Voltage			Vista	50.0A	
			E-Rated, Standard Speed		
RIGGS-VISTA	1A.02	938	S&C Vista	50.0A	50 Amps
High Voltage			Vista	50.0A	
			E-Rated, Standard Speed		
SCALES-VISTA	1B.02	869	S&C Vista	25.0A	25.0 Amps
High Voltage			Vista	25.0A	
			E-Rated, Standard Speed		
SEN-VISTA	4C.03	1077	S&C Vista	65.0A	65 Amps
High Voltage			Vista	65.0A	
			E-Rated, Standard Speed		
SERV B-VISTA	2C.01	1002	S&C Vista	25.0A	25.0 Amps
High Voltage			Vista	25.0A	
			E-Rated, Standard Speed		
SNYGG FU	2A02.1	989	0.0A	2.0X / 0.000s	
Low Voltage				5.0X / 0.000s	
				10.0X / 0.000s	
SNYGG-VISTA	2A.02	985	S&C Vista	80.0A	80 Amps
High Voltage			Vista	80.0A	
			E-Rated, Standard Speed		

SUNY OSWEGO
RECOMMENDED FUSE SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	Cartridge/Trip	Settings
SWETMAN-VISTA	2A.01	977	S&C Vista	65.0A	65 Amps
High Voltage			Vista	65.0A	
			E-Rated, Standard Speed		
TY-1-VISTA	4C.02	79	S&C Vista	80.0A	80 Amps
High Voltage			Vista	80.0A	
			E-Rated, Standard Speed		
TY-2-VISTA	4C.02	79	S&C Vista	25.0A	25.0 Amps
High Voltage			Vista	25.0A	
			E-Rated, Standard Speed		
WALKER-VISTA	1B.03	917	S&C Vista	25.0A	25.0 Amps
High Voltage			Vista	25.0A	
			E-Rated, Standard Speed		
WATER-VISTA	1B.01	867	S&C Vista	25.0A	25.0 Amps
High Voltage			Vista	25.0A	
			E-Rated, Standard Speed		
WILBER-VISTA	2A.03	993	S&C Vista	65.0A	65 Amps
High Voltage			Vista	65.0A	
			E-Rated, Standard Speed		

SUNY OSWEGO
RECOMMENDED HIGH/MEDIUM VOLTAGE BREAKER SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	Frame/Sensor/Plug	Settings
PARK-G&W	2C.04	1026	G&W	600.0A	Minimum Trip 60A (60A)
HV/MV with Trip-Unit			Type 2-3, E Speed Standard		0.0 Time Delay
			15-300A, 500:1 CT		
PIEZ G&W 1	5C.01	814	G&W	600.0A	Minimum Trip 175A (175A)
HV/MV with Trip-Unit			Type 2-3, E Speed Standard		0.0 Time Delay
			15-300A, 500:1 CT		
PIEZ G&W 2	5C.01	814	G&W	600.0A	Minimum Trip 225A (225A)
HV/MV with Trip-Unit			Type 2-3, E Speed Standard		0.0 Time Delay
			15-300A, 500:1 CT		
SHADY VISTA	1A.03	946	S&C	600.0A	Phase
HV/MV with Trip-Unit			Vista	600.0A	150A
			Main Fault Interrupter		GF
					50A

SUNY OSWEGO
RECOMMENDED LOW VOLTAGE BREAKER SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	Frame/Sensor/Plug	Settings
CAMP CENT MAIN	2A01.1	981	CUTLER-HAMMER	3200.0A	LTPU (0.5-1.0 x P) 1 (2000A)
Static Trip			DS, RMS 510/610/810/910	2400.0A	LTD (2-24 Sec.) 24
			LSI, 200-5000A	2000.0A	STPU (2-10 x LTPU) 4 (8000A)
					STD (0.1-0.5 Sec.) 0.5 Sec. (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (2-12 x P) M1(8) (16000A)
CAYUGA SM	4B05.1	198	CUTLER-HAMMER	1600.0A	LTPU (0.5-1.0 x P) 0.5 (800A)
Static Trip			DS, RMS 510/610/810/910	1600.0A	LTD (2-24 Sec.) 15
			LSI, 200-5000A	1600.0A	STPU (2-10 x LTPU) 4 (3200A)
					STD (0.1-0.5 Sec.) 0.1 Sec. (I^2t Out)
					INST (2-12 x P) M2(12) (19200A)
CONV MAIN	3B01.1	1071	GE	1600.0A	LTPU (0.5-1.0 x P) 1 (1600A)
Static Trip			SS, SH PowerBreak II, MVT Plus/PM	1600.0A	LTD (1-4) 1
			LSI, 200-2000A Sensors	1600.0A	STPU (1.5-9 x LTPU) 4 (6400A)
					STD (Min-Max) Min (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (1.5-15 x P) 10 (16000A)
COOP MAIN	3C02.1	279	CUTLER-HAMMER	2000.0A	LTPU (0.5-1.0 x P) 0.8 (1600A)
Static Trip			DS, RMS 510/610/810/910	2000.0A	LTD (2-24 Sec.) 2
			LSI, 200-5000A	2000.0A	STPU (2-10 x LTPU) 5 (8000A)
					STD (0.1-0.5 Sec.) 0.5 Sec. (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (2-12 x P) M1(8) (16000A)
CULK MAIN	3C04.1	140	CUTLER-HAMMER	3200.0A	LTPU (0.5-1.0 x P) 1 (3200A)
Static Trip			DS, RMS 510/610/810/910	3200.0A	LTD (2-24 Sec.) 20
			LS, 200-5000A	3200.0A	STPU (2-10 x LTPU) 2 (6400A)
					STD (0.1-0.5 Sec.) 0.1 Sec. (I^2t Out)
EPL-1 Fdr	1A01A.1.4	1237	CUTLER-HAMMER	400.0A	Thermal Curve (Fixed)
Thermal Magnetic			HKD	400.0A	INST (5-10 x Trip) 5 (2000A)
			100-400A		
EPL-1 Main	1A01A1.4.3	1268	CUTLER-HAMMER	800.0A	Thermal Curve (Fixed)
Thermal Magnetic			MDLB	800.0A	INST (4-8 x Trip) 4 (3200A)
			300-800A		
EPP-1 Fdr	1A01A.1.1	1254	CUTLER-HAMMER	800.0A	LTPU (0.5-1.0 x P) 1 (800A)
Static Trip			DS, RMS 510/610/810/910	800.0A	LTD (2-24 Sec.) 10
			LSI, 200-5000A	800.0A	STPU (2-10 x LTPU) 4 (3200A)
					STD (0.1-0.5 Sec.) 0.3 Sec. (I^2t Out)
					INST (2-12 x P) 6 (4800A)
					GFPU (100-1200A Plug) A (200A)
	RECOMMENDED TEMPORARY ONLY SETTINGS				GFD (0.1-0.5 Sec.) 0.5 Sec. (I^2t Out)
FUNN MAIN	3C01.1	277	0.0A		DEVICE DATA UNAVAILABLE
Static Trip					

SUNY OSWEGO
RECOMMENDED LOW VOLTAGE BREAKER SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	Frame/Sensor/Plug	Settings
HART MAIN	3C03.1	132	CUTLER-HAMMER	1200.0A	LTPU (1.0 x P) Fixed (1200A)
Static Trip			ND, RMS 310	1200.0A	LTD (Fixed) Fixed
			LS, 400-1200A Fixed Plug	1200.0A	STPU (2-8 x LTPU) 4 (4800A)
					STD (Fixed) Fixed (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (14000A) Fixed (14000A)
HEW 2 MAIN	4C01.2	91	CUTLER-HAMMER	800.0A	Thermal Curve (Fixed)
Thermal Magnetic			MDL	800.0A	INST (4-8 x Trip) 8 (6400A)
			300-800A		
HEW-1 SM	4C01.1	90	CUTLER-HAMMER	3200.0A	LTPU (0.5-1.0 x P) 1 (3200A)
Static Trip			DS, RMS 510/610/810/910	3200.0A	LTD (2-24 Sec.) 4
			LSI, 200-5000A	3200.0A	STPU (2-10 x LTPU) 3 (9600A)
					STD (0.1-0.5 Sec.) 0.1 Sec. (I^2t In)
					INST (2-12 x P) M2(12) (38400A)
Hewitt	4C.01.0	1085	0.0A		DEVICE DATA UNAVAILABLE
Specialty Device					
JOHNS-MAIN	1A03.1	950	CUTLER-HAMMER	4000.0A	LTPU (0.4-1.0 x P) 1 (4000A)
Static Trip			Magnum DS, RMS 520	4000.0A	LTD (2-24 Sec.) 4
			LSI, 4000AF, 3200-4000A Plugs	4000.0A	STPU (2-12 x LTPU) 3 (12000A)
					STD (0.1-0.5 Sec.) 0.3 (I^2t Out)
					INST (2-12 x P) 4 (16000A)
LAKE MAIN	1A04.1	962	CUTLER-HAMMER	1200.0A	LTPU (1.0 x P) Fixed (1200A)
Static Trip			CHND, RMS 310	1200.0A	LTD (Fixed) Fixed
			LSI, 400-1200A Fixed Plug	1200.0A	STPU (2-8 x P) 8 (9600A)
					STD (Inst-300 ms) 100 ms (I^2t Out)
					INST (14000A) Fixed (14000A)
LAN MAIN	3B03.1	153	CUTLER-HAMMER	2000.0A	LTPU (0.5-1.0 x P) 1 (2000A)
Static Trip			DS, RMS 510/610/810/910	2000.0A	LTD (2-24 Sec.) 20
			LSI, 200-5000A	2000.0A	STPU (2-10 x LTPU) 4 (8000A)
					STD (0.1-0.5 Sec.) 0.1 Sec. (I^2t In)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (2-12 x P) M2(12) (24000A)
LEE 208V MAIN	1A01A.2	937	0.0A		DEVICE DATA UNAVAILABLE
Static Trip					
LEE 480V MAIN	1A01A.1	929	WESTINGHOUSE	1600.0A	LTPU 0.5 (800A)
Static Trip			DS	1600.0A	LTD 4.0
			AMPTECT IA		STPU 4.0 (6400A)
					STD 0.18
					INST 4.0 (6400A)
					PU 50A sensor A (13A)
					0.22 sec. Delay

SUNY OSWEGO
RECOMMENDED LOW VOLTAGE BREAKER SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	Frame/Sensor/Plug	Settings
Load Bank Bkr	G01.2	1257	SIEMENS	800.0A	Thermal Curve (Fixed)
Thermal Magnetic			MXD6 Sentron	800.0A	INST (LO-HI) LO (4000A)
			500-800A		
LP MAIN	4B04.1	189	CUTLER-HAMMER	1600.0A	LTPU (0.5-1.0 x P) 1 (1200A)
Static Trip			DS, RMS 510/610/810/910	1600.0A	LTD (2-24 Sec.) 15
			LSI, 200-5000A	1200.0A	STPU (2-10 x LTPU) 4 (4800A)
					STD (0.1-0.5 Sec.) 0.1 Sec. (I^2t Out)
					INST (2-12 x P) M2(12) (14400A)
MAC MAIN	2C02.1	1014	WESTINGHOUSE	2000.0A	LTPU 0.5 (600A)
Static Trip			DS DIGITRP	1200.0A	LTD 2.0
			LSI 100-4K		STPU 6.0 (7200A)
					STD-I2T 0.5 (I^2t In)
					INST 6.0 (7200A)
MAHAR MAIN	3B04.1	162	CUTLER-HAMMER	2000.0A	LTPU (0.5-1.0 x P) 1 (2000A)
Static Trip			DS, RMS 510/610/810/910	2000.0A	LTD (2-24 Sec.) 20
			LSI, 200-5000A	2000.0A	STPU (2-10 x LTPU) 4 (8000A)
					STD (0.1-0.5 Sec.) 0.1 Sec. (I^2t In)
					INST (2-12 x P) M2(12) (24000A)
ONEIDA MAIN	4B02.1	180	CUTLER-HAMMER	1600.0A	LTPU (0.5-1.0 x P) 1 (1200A)
Static Trip			DS, RMS 510/610/810/910	1600.0A	LTD (2-24 Sec.) 7
			LSI, 200-5000A	1200.0A	STPU (2-10 x LTPU) 4 (4800A)
					STD (0.1-0.5 Sec.) 0.1 Sec. (I^2t Out)
					INST (2-12 x P) M2(12) (14400A)
PARK MAIN	2C04.1	1030	CUTLER-HAMMER	3200.0A	LTPU (0.5-1.0 x P) 0.5 (1200A)
Static Trip			DS, RMS 510/610/810/910	2400.0A	LTD (2-24 Sec.) 2
			LSI, 200-5000A	2400.0A	STPU (2-10 x LTPU) 6 (7200A)
					STD (0.1-0.5 Sec.) 0.5 Sec. (I^2t Out)
					INST (2-12 x P) M1(8) (19200A)
PATH MAIN	4C04.1	114	CUTLER-HAMMER	1600.0A	LTPU (0.5-1.0 x P) 1 (1200A)
Static Trip			DS, RMS 510/610/810/910	1600.0A	LTD (2-24 Sec.) 15
			LSI, 200-5000A	1200.0A	STPU (2-10 x LTPU) 4 (4800A)
					STD (0.1-0.5 Sec.) 0.1 Sec. (I^2t Out)
					INST (2-12 x P) M2(12) (14400A)
PEN MAIN	3B02.1	144	CUTLER-HAMMER	3200.0A	LTPU (0.5-1.0 x P) 1 (3200A)
Static Trip			DS, RMS 510/610/810/910	3200.0A	LTD (2-24 Sec.) 20
			LSI, 200-5000A	3200.0A	STPU (2-10 x LTPU) 2 (6400A)
					STD (0.1-0.5 Sec.) 0.1 Sec. (I^2t Out)

SUNY OSWEGO
RECOMMENDED LOW VOLTAGE BREAKER SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	Frame/Sensor/Plug	Settings
PIEZ 1 MAIN	5C01.1.2	343	CUTLER-HAMMER	3000.0A	LTPU, (0.4-1.0 x P) 1 (3000A)
Static Trip			Magnum SB, DT 520	3000.0A	LTD, (2-24 Sec.) 4
			LSI, 3000AF, 200-3000AP	3000.0A	STPU, (2-10 x Ir) 2 (6000A)
					STD, (0.1-0.5 Sec.) 0.4 (I^2t Out)
					INST, (2-14 x P) 10 (30000A)
					INST OR, (Fixed) 18 x In (54000A)
					GFPU A (750A)
					GF Delay 0.2 (I^2t Out)
PIEZ 2 MAIN	5C012.1	742	CUTLER-HAMMER	5000.0A	Ir, (0.4-1.0 x P) 0.8 (4000A)
Static Trip			Magnum SB, DT 520	5000.0A	LTD, (2-24 Sec.) 2
			LSI, 5000A DWF, 2500-5000AP	5000.0A	STPU, (2-10 x Ir) 2 (8000A)
					STD, (0.1-0.5 Sec.) 0.3 (I^2t Out)
					INST, (2-14 x P) 3000-5000A M1 (60000A)
					GFPU (0.25-1.00 x P 200-1200A) 0.25 (1250A)
					GFD (0.1-0.5 Sec.) 0.1 (I^2t Out)
PP-4 Fdr	1A01A.1.4	1237	CUTLER-HAMMER	400.0A	Thermal Curve (Fixed)
Thermal Magnetic			HKD	400.0A	INST (5-10 x Trip) 5 (2000A)
			100-400A		
RICH MAIN 1	2C03.2	1022	CUTLER-HAMMER	1200.0A	LTPU (1.0 x P) Fixed (1200A)
Static Trip			CHND, RMS 310	1200.0A	LTD (Fixed) Fixed
			LS, 400-1200A Fixed Plug	1200.0A	STPU (2-8 x P) 4 (4800A)
					STD (Fixed) Fixed (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (14000A) Fixed (14000A)
RICH MAIN 2	2C03.1	1091	SIEMENS	1600.0A	LTPU (0.5-1.0 x S) 0.5 (800A)
Static Trip			RL, Static Trip III	1600.0A	LTD (3.5-30 Sec.) 3.5
			LSI, 150-5000A		STPU (2-12 x LTPU) 2 (1600A)
					STD (0.08-0.4 Sec.) 0.22 (I^2t Out)
					INST (2-15 x S) 2 (3200A)
RIGGS MAIN	1A02.1	942	CUTLER-HAMMER	1200.0A	LTPU (1.0 x P) Fixed (1200A)
Static Trip			CHND, RMS 310	1200.0A	LTD (Fixed) Fixed
			LS, 400-1200A Fixed Plug	1200.0A	STPU (2-8 x P) 8 (9600A)
					STD (Fixed) Fixed (I^2t Out)
					INST (14000A) Fixed (14000A)
SCALES MAIN	1B02.1	883	CUTLER-HAMMER	1200.0A	LTPU (1.0 x P) Fixed (1200A)
Static Trip			CHND, RMS 310	1200.0A	LTD (Fixed) Fixed
			LS, 400-1200A Fixed Plug	1200.0A	STPU (2-8 x P) 3 (3600A)
					STD (Fixed) Fixed (I^2t In)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (14000A) Fixed (14000A)
SEN MAIN	4C03.1	109	CUTLER-HAMMER	2000.0A	LTPU (0.5-1.0 x P) 1 (2000A)
Static Trip			DS, RMS 510/610/810/910	2000.0A	LTD (2-24 Sec.) 7
			LSI, 200-5000A	2000.0A	STPU (2-10 x LTPU) 2 (4000A)
					STD (0.1-0.5 Sec.) 0.1 Sec. (I^2t Out)
					INST (2-12 x P) M2(12) (24000A)

SUNY OSWEGO
RECOMMENDED LOW VOLTAGE BREAKER SETTINGS

Name/Type	BusConnectedName	BusConnectedId	Description	Frame/Sensor/Plug	Settings
SERV MAIN	2C01.1	1006	CUTLER-HAMMER	400.0A	Thermal Curve (Fixed)
Thermal Magnetic			DK	400.0A	INST (5-10 x Trip) 10 (4000A)
			250-400A		
Standby Bkr	G01.1	1249	SIEMENS	800.0A	Thermal Curve (Fixed)
Thermal Magnetic			MXD6 Sentron	800.0A	INST (LO-HI) LO (4000A)
			500-800A		
TY-1 MAIN	4C02.1	92	CUTLER-HAMMER	3200.0A	LTPU (0.5-1.0 x P) 1 (3200A)
Static Trip			DS, RMS 510/610/810/910	3200.0A	LTD (2-24 Sec.) 4
			LSI, 200-5000A	3200.0A	STPU (2-10 x LTPU) 2.5 (8000A)
					STD (0.1-0.5 Sec.) 0.1 Sec. (I^2t In)
					INST (2-12 x P) M2(12) (38400A)
TY-2 MAIN	4C02.2	93	CUTLER-HAMMER	225.0A	Fixed
Thermal Magnetic			HFD	225.0A	
			15-225A		
WALKER MAIN	1B03.1	921	CUTLER-HAMMER	1200.0A	LTPU (1.0 x P) Fixed (1200A)
Static Trip			CHND, RMS 310	1200.0A	LTD (Fixed) Fixed
			LS, 400-1200A Fixed Plug	1200.0A	STPU (2-8 x P) 3 (3600A)
					STD (Fixed) Fixed (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (14000A) Fixed (14000A)
WATER MAIN	1B01.1	880	0.0A		DEVICE DATA UNAVAILABLE
Static Trip					
WILBER MAIN	2A03.1	997	CUTLER-HAMMER	3200.0A	LTPU (0.5-1.0 x P) 1 (2400A)
Static Trip			DS, RMS 510/610/810/910	2400.0A	LTD (2-24 Sec.) 24
			LSI, 200-5000A	2400.0A	STPU (2-10 x LTPU) 4 (9600A)
					STD (0.1-0.5 Sec.) 0.5 Sec. (I^2t Out)
	RECOMMENDED TEMPORARY ONLY SETTINGS				INST (2-12 x P) 6 (14400A)

SUNY OSWEGO – 13.2kV SYSTEM STUDY
TRANSFORMER 1 PRIMARY PHASE OVERCURRENT DEVICE
T1-P-50/51 (T2-P-50/51 Typical)

TCC:	001, 003
Device:	Multilin SR-745 Relay
Existing Settings:	0.6 AT (240A), 4.7 TD Ext. Inverse, Inst 4.1.
CT Ratio:	1200:5 MR tapped at 400:5 *Note: This relay uses CT primary amps to calculate tap settings.*
Transformer:	5000/6250 kVA, 7.4% Z 104.6 FLA @ 34.5kV, 273.4 FLA @ 13.2kV, 669.4 A Inrush at 0.1 sec

Pickup:
Set not more than 400% of transformer FLA
Set not more than 67% of upstream device
600 x 0.67 = 402 amps
Set not less than secondary device
Existing setting is satisfactory
Set for 0.6 (240A)

Delay:
Set under transformer infrequent fault curve.
Set not less than 0.4 seconds under the upstream Electro-Mechanical device
Set not less than 0.3 seconds above the downstream solid state relay
Set for 2.5 TD on the Normal Inverse Curve

Instantaneous:
Set to ride through the transformer inrush,
Set for 170% of the secondary fault
2505 x 1.7 x 13.2/34.5 = 1630
Existing setting is satisfactory
Set for 4.1X (1640A)

Note:
This device does not coordinate with the upstream device for faults 4000A and greater.

SUNY OSWEGO – 13.2kV SYSTEM STUDY
TRANSFORMER 1 BACKUP PRIMARY PHASE OVERCURRENT DEVICE
T1-P-50/51-BU (T2-P-50/51-BU Typical)

TCC: 001, 003

Device: Multilin SR-735 Relay

Existing Settings: 0.6 AT (240A), 4.7 TD Ext. Inverse, Inst 5.0.

CT Ratio: 1200:5 MR tapped at 1200:5
Note: This relay uses CT primary amps to calculate tap settings.

Transformer: 5000/6250 kVA, 7.4% Z
104.6 FLA @ 34.5kV, 273.4 FLA @ 13.2kV, 669.4 A Inrush at 0.1 sec

Pickup:
Set to match main device
Existing setting is satisfactory
Set for 0.6 (240A)

Delay:
Set to match the main device
Set for 5.0 TD on the Normal Inverse Curve (0.5X Multiplier)

Instantaneous:
Set to match the main device, as possible
Set for 5.0X (2000A)

Note:
This device does not coordinate with the upstream device for faults 4000A and greater.

SUNY OSWEGO – 13.2kV SYSTEM STUDY
TRANSFORMER 1 SECONDARY PHASE OVERCURRENT DEVICE
T1-50/51 (T2-50/51 Typical)

TCC: 001, 003

Device: Multilin SR-760 Relay

Existing Settings: 0.35 AT, 7.0 TD Ext. Inverse, Inst OFF.

CT Ratio: 1200:5 MR tapped at 1200:5
Note: This relay uses CT primary amps to calculate tap settings.

Transformer: 5000/6250 kVA, 7.4% Z
104.6 FLA @ 34.5kV, 273.4 FLA @ 13.2kV, 669.4 A Inrush at 0.1 sec

Pickup:
Set not more than 250% of transformer FLA
Set not more than the upstream device
Set not less than secondary redundant device
Set for 0.43 (516A)

Delay:
Set under transformer infrequent fault curve.
Set not less than 0.3 seconds under the upstream solid state relay
Set not less than 0.3 seconds above the downstream solid state relay
Set for 3.3 TD on the Extremely Inverse Curve

Instantaneous:
OFF

SUNY OSWEGO – 13.2kV SYSTEM STUDY
T1 Transformer Differential Relay (T2 Transformer Differential Relay Typical)
T1-87 (T2-87 Typical)

Existing Device:	Basler BE1-87T
Existing Settings:	Primary Tap 4.0 AT, Secondary Tap 8.0 AT, Unrestrained Slope E 10%, Restrained Slope D 30%
Primary CTs	1200:5 Tapped at 400:5 (80:1) Wye
Secondary CTs	1200:5 (240:1) Delta2
Transformer	5/6.25 MVA 34.5kV Delta Primary – 13.2kV Wye Secondary, 7.4 %Z 104.6 FLA at 34.5kV, 273.4 FLA at 13.2kV
Primary Amps	104.6 / 80 = 1.31
Secondary Amps	(273.4 / 240) x 1.73 = 1.97
Ratio:	1.97/1.31 = 1.52 (less than 4.45 – CT ratios are satisfactory)

Primary Tap:
Primary CT Secondary Fault Current 6300 / 80 = 78.75
Set not more than 21A SC (0.7 x 78.75) / 21 = 2.63 Go to 3.0
Set for 3.0 AT

Secondary Tap:
Set using relay ratio 3 x 1.97 / 1.31 = 4.51
Set for 4.5 AT

Unrestrained Slope:
Primary CT Secondary Fault Current 6300 / 80 = 78.75
Secondary CT Secondary Fault Current 2510 / 240 = 10.46
Set for 70% of Largest Fault/Tap ratio = 0.7 x Fault / Tap = 0.7 x 78.75 / 3.0 = 18.375
Set for R 20X Tap

Restrained Slope:
Current Ratio = Pri. Relay Current / Sec. Relay Current = 1.3075 / (1.139 x 1.73) = 0.663
Tap Ratio = T1 / T2 = 3 / 4.5 = 0.667
CT Mismatch = 100 x | (Current Ratio – Tap Ratio) / Smaller of the two |
- 100 x | ((0.663 - 0.667) / 0.663) | = 100 x 0.00603 = 0.603 or 0.603%
- Add LTC and NLTC: 0.603 + 10% +5% = 15.603%

Self Cooled Current Rating
- (Relay Current x MVA[Self-Cooled]) / (Tap x MVA[Forced-Cooled])
- Primary = (1.3075 x 5) / (4 x 6.25) = 0.2615

Slope = 3 + ((35 * (CT Mismatch + 3)) / (23 – (4 x Self Cooled Current Rating)))
3 + ((35 * (10.6 + 3)) / (23 – (4 x 0.2615))) = 24.68
Set for D 30%

Project Name: SUNY-OSWEGO April 2013
TCC Name: 001.tcc
Reference Voltage: 34500 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	NMPC 50/51	TCC Name:	001.tcc
Bus Name:	0.000	Bus Voltage:	34500.0V
Function Name:	Phase		
Manufacturer:	WESTINGHOUSE		
Description:	50/51		
Type:	CO-6	Class Desc:	CO-6
AIC Rating:	N/A	Fault Duty:	6303.0A
Current Rating:	500A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0

Setting				Test Points
1) Tap	6.0	(600A)		@2.0X, 1.663s
2) Time Dials	3.9			@5.0X, 0.952s
3) INST (High)	40	(4000A)		@10.0X, 0.852s

Device Name:	T1 P-50/51	TCC Name:	001.tcc
Bus Name:	0.000	Bus Voltage:	34500.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR745 Xfmr Relay	Class Desc:	SR745
AIC Rating:	N/A	Fault Duty:	6303.0A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0

Setting				Test Points
1) OC Pickup	0.6	(240A)		@2.0X, 4.414s
2) Norm Inverse	2.5	1		@5.0X, 1.017s
3) Inst OC Pickup	4.1	(1640A)		@10.0X, 0.565s

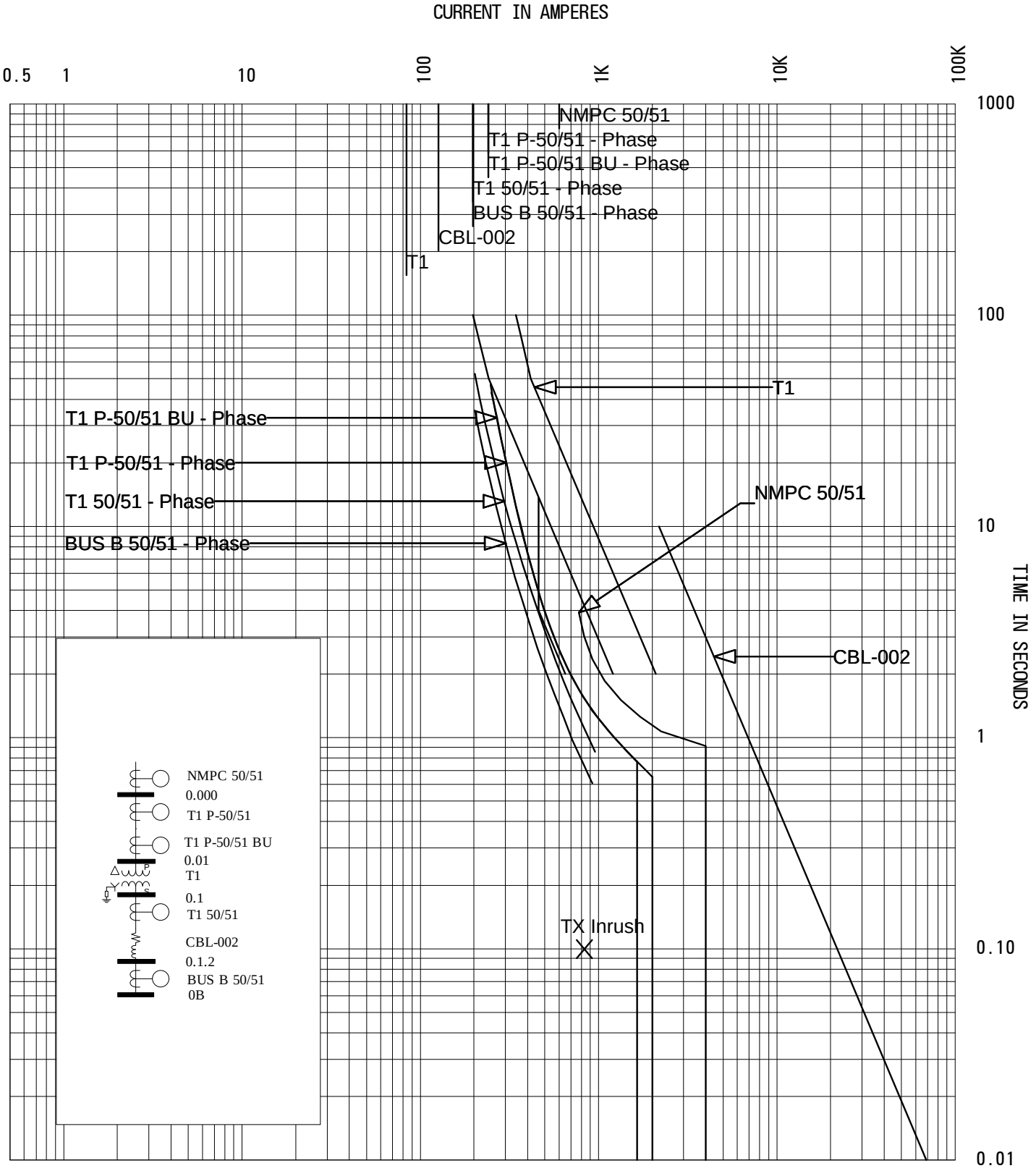
Device Name:	T1	TCC Name:	001.tcc
Bus Name:	0.01	Bus Voltage:	34500.0V / 13200V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	34500 LL/13200 LL
Nominal Size:	5000.0kVA		
Impedance (%Z):	7.4000	Pri Connection:	Delta
Inrush Factor:	10.0x	Sec Connection:	Wye-Ground

Device Name: T1 50/51 TCC Name: 001.tcc
Bus Name: 0.1.1 Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 2505.4A
Current Rating: 1200A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 0.43 (516A) Test Points: @2.0X, 5.756s
2) Ext Inverse 3.3 1 @5.0X, 0.816s
@10.0X, 0.324s

Device Name: T1 P-50/51 BU TCC Name: 001.tcc
Bus Name: 0.000 Bus Voltage: 34500.0V
Function Name: Phase
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR735/737 Feeder Relay Class Desc: SR737
AIC Rating: N/A Fault Duty: 6303.0A
Current Rating: 400A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) Pickup(Lo) 60 % (240A) Test Points: @2.0X, 4.414s
2) NORM INV 0.5 5 @5.0X, 1.017s
3) INST 5.0 (2000A)

Device Name: CBL-002 TCC Name: 001.tcc
Bus Name: 0.1.1 Bus Voltage: 13200.0V
Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Description: Cable Damage Curve Qty/Ph: 1
Size: 250 Cont. Temp: 90 deg C.
Material: Copper Damage Temp: 250 deg C.

Device Name: BUS B 50/51 TCC Name: 001.tcc
Bus Name: 0B Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 2414.8A
Current Rating: 1200A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 0.43 (516A) Test Points: @2.0X, 3.838s
2) Ext Inverse 2.2 1 @5.0X, 0.544s
@10.0X, 0.216s



TCC Name: 001
Oneline: 001-Transformer T1
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 34500
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
BUS A MAIN PHASE OVERCURRENT RELAY (BUS B TYPICAL)
BUS A-50/51 (BUS B-50/51 Typical)

TCC:	001, 002, 003, 004, 1A-001, 1B-001 , 2A-001, 5A-001, 3B-001, 4B-001
Device:	Multilin SR-760 Relay
Existing Settings:	0.29 AT, 6.0 TD Ext. Inverse, Inst OFF.
CT Ratio:	1200:5 MR tapped at 1200:5 *Note: This relay uses CT primary amps to calculate tap settings.*
Feeder:	One per phase 250 MCM rated at 325 Amps

Pickup:
Set not more than 600% of cable rating
Set not more than the upstream device
Set not less than 150% of the largest downstream device
340 x 1.5 = 510
Set for 0.4.3 (516A)

Delay:
Set under transformer infrequent fault curve.
Set not less than 0.3 seconds under the upstream solid state relay
Set not less than 0.3 seconds above the downstream solid state relay
Set for 2.2 TD on the Extremely Inverse Curve

Instantaneous:
OFF

Project Name: SUNY-OSWEGO April 2013
TCC Name: 002.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	T1 P-50/51	TCC Name:	002.tcc
Bus Name:	0.000	Bus Voltage:	34500.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR745 Xfmr Relay	Class Desc:	SR745
AIC Rating:	N/A	Fault Duty:	6303.0A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0

Setting				Test Points
1) OC Pickup	0.6	(240A)		@2.0X, 4.414s
2) Norm Inverse	2.5	1		@5.0X, 1.017s
3) Inst OC Pickup	4.1	(1640A)		@10.0X, 0.565s

Device Name:	T1 P-50/51 BU	TCC Name:	002.tcc
Bus Name:	0.000	Bus Voltage:	34500.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR735/737 Feeder Relay	Class Desc:	SR737
AIC Rating:	N/A	Fault Duty:	6303.0A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0

Setting				Test Points
1) Pickup(Lo)	60 %	(240A)		@2.0X, 4.414s
2) NORM INV	0.5	5		@5.0X, 1.017s
3) INST	5.0	(2000A)		

Device Name:	T1	TCC Name:	002.tcc
Bus Name:	0.01	Bus Voltage:	34500.0V / 13200V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	34500 LL/13200 LL
Nominal Size:	5000.0kVA		
Impedance (%Z):	7.4000	Pri Connection:	Delta
Inrush Factor:	10.0x	Sec Connection:	Wye-Ground

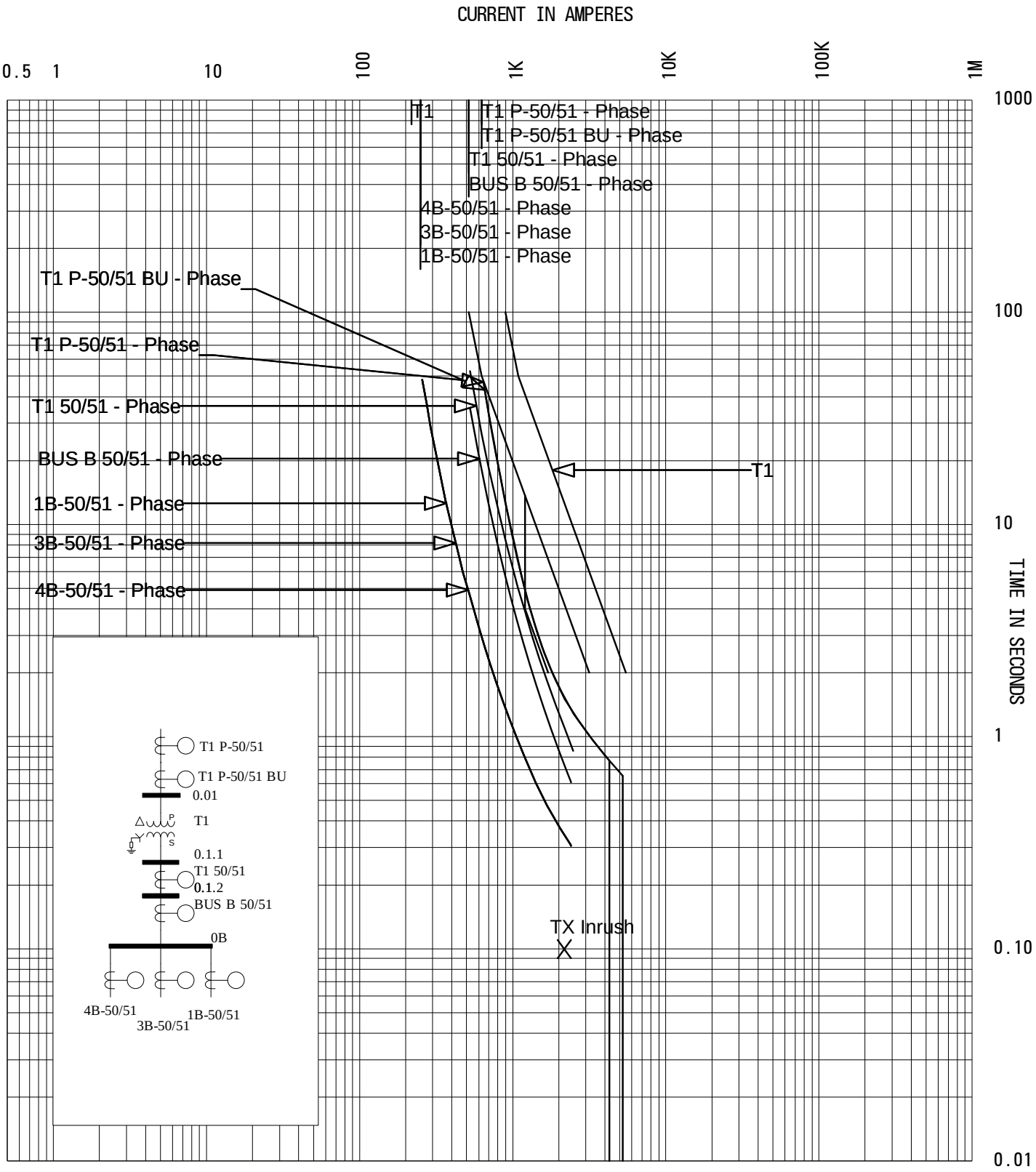
Device Name: T1 50/51 TCC Name: 002.tcc
Bus Name: 0.1.1 Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 2505.4A
Current Rating: 1200A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 0.43 (516A) Test Points: @2.0X, 5.756s
2) Ext Inverse 3.3 1 @5.0X, 0.816s
@10.0X, 0.324s

Device Name: BUS B 50/51 TCC Name: 002.tcc
Bus Name: 0B Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 2414.8A
Current Rating: 1200A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 0.43 (516A) Test Points: @2.0X, 3.838s
2) Ext Inverse 2.2 1 @5.0X, 0.544s
@10.0X, 0.216s

Device Name: 4B-50/51 TCC Name: 002.tcc
Bus Name: 0B Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 2414.8A
Current Rating: 200A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 1.25 (250A) Test Points: @2.0X, 5.233s
2) Ext Inverse 3 1 @5.0X, 0.742s
@10.0X, 0.295s

Device Name:	3B-50/51			TCC Name:	002.tcc
Bus Name:	0B			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	MULTILIN				
Description:	5A CT Sec				
Type:	SR750/760 Feeder Relay			Class Desc:	SR760
AIC Rating:	N/A			Fault Duty:	2414.8A
Current Rating:	200A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) OC Pickup		1.25	(250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse		3	1		@5.0X, 0.742s
					@10.0X, 0.295s

Device Name:	1B-50/51			TCC Name:	002.tcc
Bus Name:	0B			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	MULTILIN				
Description:	5A CT Sec				
Type:	SR750/760 Feeder Relay			Class Desc:	SR760
AIC Rating:	N/A			Fault Duty:	2414.8A
Current Rating:	200A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) OC Pickup		1.25	(250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse		3	1		@5.0X, 0.742s
					@10.0X, 0.295s



TCC Name: 002
Oneline: 002-13.2kV Bus B
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

Project Name: SUNY-OSWEGO April 2013
TCC Name: 003.tcc
Reference Voltage: 34500 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	NMPC 50/51			TCC Name:	003.tcc
Bus Name:	0.000			Bus Voltage:	34500.0V
Function Name:	Phase				
Manufacturer:	WESTINGHOUSE				
Description:	50/51				
Type:	CO-6			Class Desc:	CO-6
AIC Rating:	N/A			Fault Duty:	6303.0A
Current Rating:	500A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) Tap		6.0	(600A)	Test Points:	@2.0X, 1.663s
2) Time Dials		3.9			@5.0X, 0.952s
3) INST (High)		40	(4000A)		@10.0X, 0.852s

Device Name:	T2 P-50/51			TCC Name:	003.tcc
Bus Name:	0.000			Bus Voltage:	34500.0V
Function Name:	Phase				
Manufacturer:	MULTILIN				
Description:	5A CT Sec				
Type:	SR745 Xfmr Relay			Class Desc:	SR745
AIC Rating:	N/A			Fault Duty:	6303.0A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) OC Pickup		0.6	(240A)	Test Points:	@2.0X, 4.414s
2) Norm Inverse		2.5	1		@5.0X, 1.017s
3) Inst OC Pickup		4.1	(1640A)		@10.0X, 0.565s

Device Name:	T2 P-50/51 BU	TCC Name:	003.tcc
Bus Name:	0.000	Bus Voltage:	34500.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR735/737 Feeder Relay	Class Desc:	SR737
AIC Rating:	N/A	Fault Duty:	6303.0A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0

Setting:				Test Points:
1) Pickup(Lo)	60 %	(240A)		@2.0X, 4.414s
2) NORM INV	0.5	5		@5.0X, 1.017s
3) INST	5.0	(2000A)		

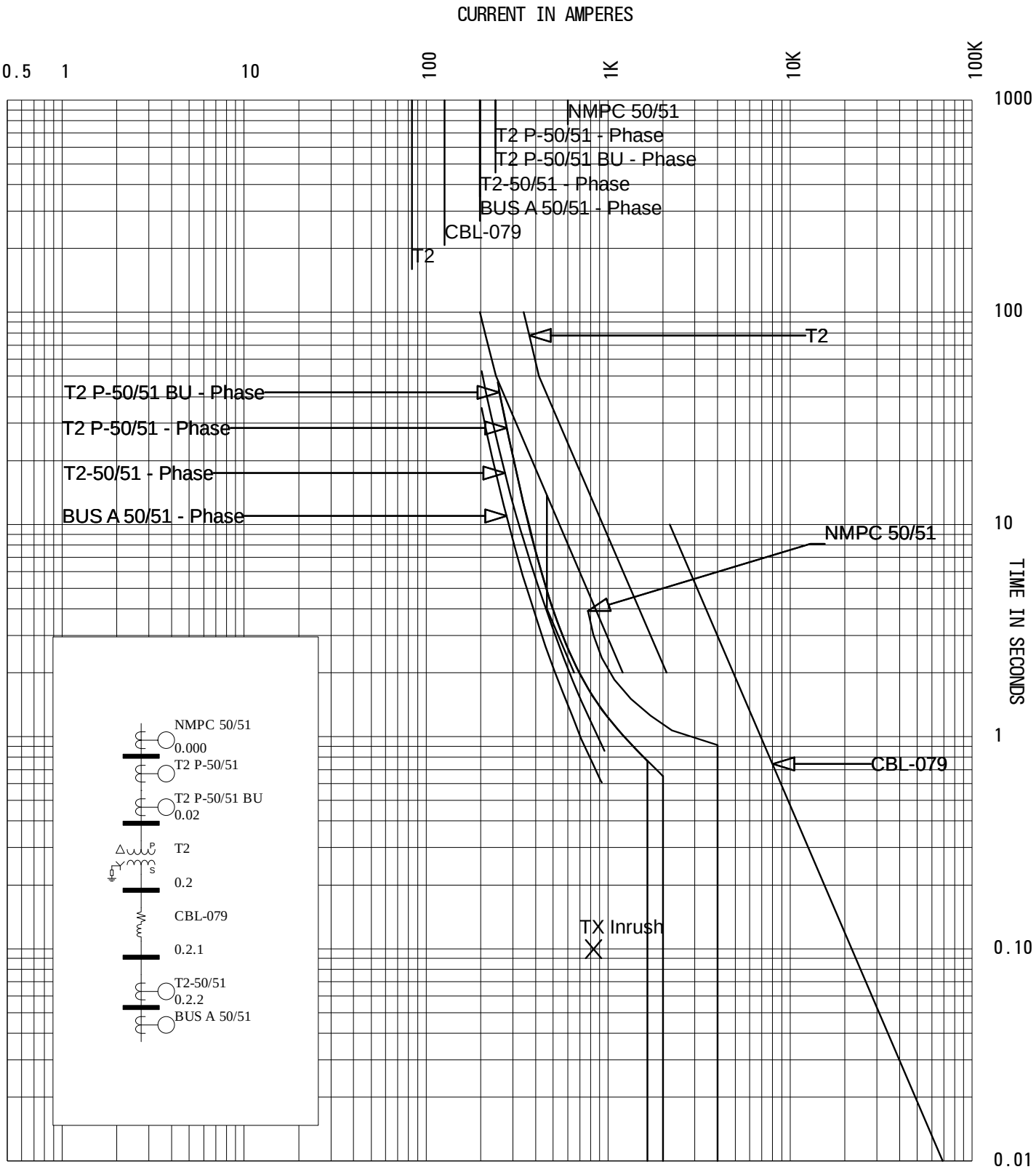
Device Name:	T2	TCC Name:	003.tcc
Bus Name:	0.02	Bus Voltage:	34500.0V / 13200V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	34500 LL/13200 LL
Nominal Size:	5000.0kVA		
Impedance (%Z):	7.4000	Pri Connection:	Delta
Inrush Factor:	10.0x	Sec Connection:	Wye-Ground

Device Name:	CBL-079	TCC Name:	003.tcc
Bus Name:	0.2	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	250	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	T2-50/51	TCC Name:	003.tcc
Bus Name:	0.2.1	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2505.4A
Current Rating:	1200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0

Setting:				Test Points:
1) OC Pickup	0.43	(516A)		@2.0X, 5.756s
2) Ext Inverse	3.3	1		@5.0X, 0.816s
				@10.0X, 0.324s

Device Name:	BUS A 50/51			TCC Name:	003.tcc
Bus Name:	0A			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	MULTILIN				
Description:	5A CT Sec				
Type:	SR750/760 Feeder Relay			Class Desc:	SR760
AIC Rating:	N/A			Fault Duty:	2414.8A
Current Rating:	1200A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) OC Pickup		0.43	(516A)	Test Points:	@2.0X, 3.838s
2) Ext Inverse		2.2	1		@5.0X, 0.544s
					@10.0X, 0.216s



TCC Name: 003
Oneline: 003-Transformer T2
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 34500
SUNY OSWEGO
35kV SUB EXPANSION

Project Name: SUNY-OSWEGO April 2013(Base Project)
TCC Name: 004.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	T2-50/51	TCC Name:	004.tcc
Bus Name:	0.2.1	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2505.4A
Current Rating:	1200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	0.43 (516A)	Test Points:	@2.0X, 5.756s
2) Ext Inverse	3.3 1		@5.0X, 0.816s
			@10.0X, 0.324s

Device Name:	CBL-080	TCC Name:	004.tcc
Bus Name:	0.2.1	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	250	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

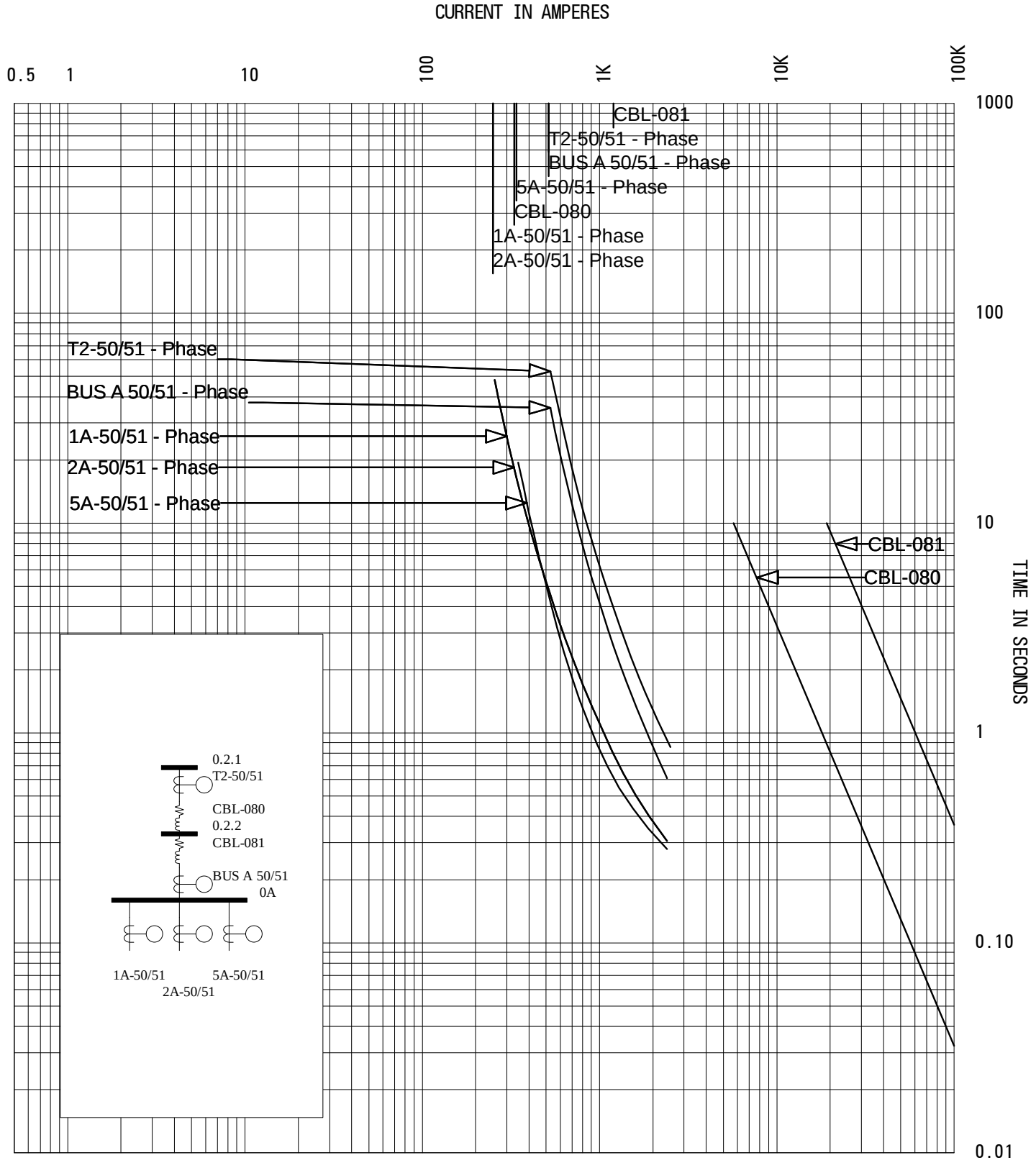
Device Name:	CBL-081	TCC Name:	004.tcc
Bus Name:	0.2.2	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1200	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name: BUS A 50/51 TCC Name: 004.tcc
Bus Name: 0A Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 2414.8A
Current Rating: 1200A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 0.43 (516A) Test Points: @2.0X, 3.838s
2) Ext Inverse 2.2 1 @5.0X, 0.544s
@10.0X, 0.216s

Device Name: 1A-50/51 TCC Name: 004.tcc
Bus Name: 0A Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 2414.8A
Current Rating: 200A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 1.25 (250A) Test Points: @2.0X, 5.233s
2) Ext Inverse 3 1 @5.0X, 0.742s
@10.0X, 0.295s

Device Name: 2A-50/51 TCC Name: 004.tcc
Bus Name: 0A Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 2414.8A
Current Rating: 200A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 1.25 (250A) Test Points: @2.0X, 5.233s
2) Ext Inverse 3 1 @5.0X, 0.742s
@10.0X, 0.295s

Device Name:	5A-50/51			TCC Name:	004.tcc
Bus Name:	0A			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	MULTILIN				
Description:	5A CT Sec				
Type:	SR750/760 Feeder Relay			Class Desc:	SR760
AIC Rating:	N/A			Fault Duty:	2414.8A
Current Rating:	200A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) OC Pickup		1.7	(340A)	Test Points:	@2.0X, 1.988s
2) Very Inverse		1.5	1		@5.0X, 0.390s
					@10.0X, 0.218s



TCC Name: 004
Oneline: 004-13.2kV Bus A
June 21, 2013 3:09 PM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
LOOP 1A FEEDER PHASE OVERCURRENT RELAY (1B, 2A, 3B & 4B TYPICAL)
1A-50/51 (1B, 2A, 3B & 4B Typical)

TCC: 002, 004, 1A-001 – 006, 1B-001 – 004 , 2A-001 – 004, 3B-001 – 005, 4B-001 – 005

Device: Multilin SR-750 Relay

Existing Settings: 1.25 AT, 4.0 TD Ext. Inverse, Inst OFF.

CT Ratio: 200:5 Note: This relay uses CT primary amps to calculate tap settings.

Feeder: 1/0 AWG 15 kV Cable rated at 200 amps

Pickup:
Set not more than 600% of the cable rating
Set not less than the upstream in line device
Set not less than 150% of the largest downstream device
125 x 1.5X = 187.5
Existing setting is satisfactory
Set for 1.25 AT (250 amps)

Delay:
Set to coordinate with upstream and downstream devices.
Set for not less than 0.3 seconds below the upstream device.
Set for not less than 0.15 seconds above the downstream device curve.
Set below the cable damage curve.
Set for 3.0 TD Extremely Inverse Curve

Instantaneous:
OFF

Project Name: SUNY-OSWEGO April 2013
TCC Name: 1A-001.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	CBL-081	TCC Name:	1A-001.tcc
Bus Name:	0.2.2	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1200	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	Main A	TCC Name:	1A-001.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	BUS A 50/51	TCC Name:	1A-001.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	1200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	0.43 (516A)	Test Points:	@2.0X, 3.838s
2) Ext Inverse	2.2 1		@5.0X, 0.544s
			@10.0X, 0.216s

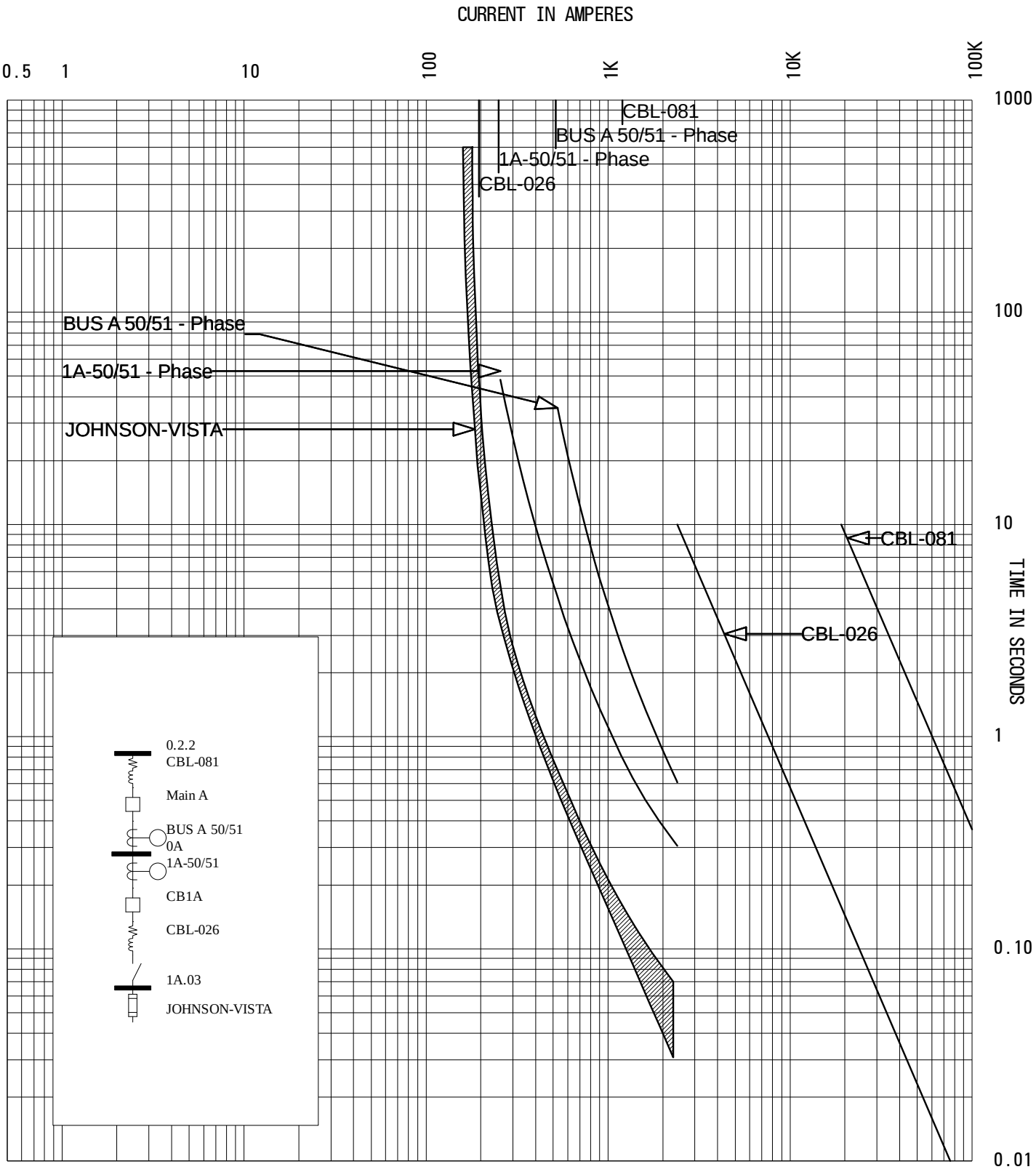
Device Name:	1A-50/51	TCC Name:	1A-001.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB1A	TCC Name:	1A-001.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-026	TCC Name:	1A-001.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0388	TCC Name:	1A-001.tcc
Bus Name:	1A.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2278.2A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

Device Name:	JOHNSON-VISTA	TCC Name:	1A-001.tcc
Bus Name:	1A.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2278.2A
Cartridge:	Vista, 80E 15500V 80A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	80A		



TCC Name: 1A-001
Oneline: 1A-001 - Feeder A1
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Lee Hall #1 Transformer Primary Overcurrent Device
LEE-FU-1

TCC: 1A-002

Existing Device: (W) CLE-40A

Transformer: 500 kVA, 13.2 – 480Y/277V, 5.41% Z
21.9 FLA @ 13.2kV, 601 FLA @ 480V

Fuse

Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 21.9 x 3 = 65.7
Set not less than secondary device 800 x (480 / 13200) = 29
Existing fuse is acceptable
Fuse for 40A

Project Name: SUNY-OSWEGO April 2013
TCC Name: 1A-002.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	1A-50/51	TCC Name:	1A-002.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB1A	TCC Name:	1A-002.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-026	TCC Name:	1A-002.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0381	TCC Name:	1A-002.tcc
Bus Name:	1A.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2411.4A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

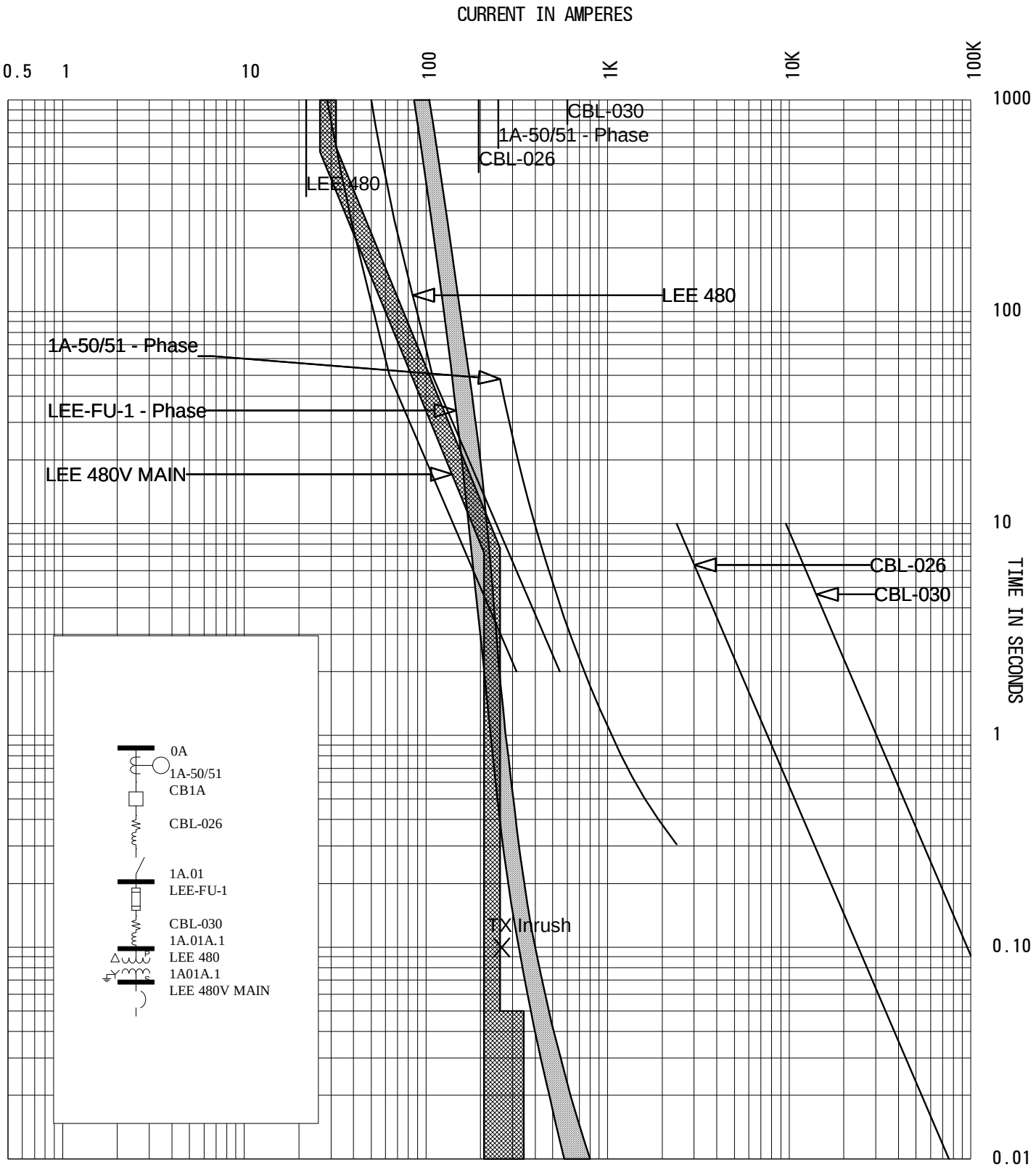
Device Name:	LEE-FU-1	TCC Name:	1A-002.tcc
Bus Name:	1A.01A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	WESTINGHOUSE		
Description:	20-80A		
Type:	CLE 15.5KV		
AIC Rating:	50kA	Fault Duty:	2406.4A
Cartridge:	CLE 15500V 40A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	40A		

Device Name:	CBL-030	TCC Name:	1A-002.tcc
Bus Name:	1A.01A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	LEE 480	TCC Name:	1A-002.tcc
Bus Name:	1A.01A.1	Bus Voltage:	13200.0V / 480V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/480 LL
Nominal Size:	500.0kVA		
Impedance (%Z):	5.4100	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	LEE 480V MAIN	TCC Name:	1A-002.tcc
Bus Name:	1A01A.1	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	WESTINGHOUSE		
Description:	AMPTECT IA		
Type:	DS		
AIC Rating:	50kA	Fault Duty:	9522.3A
Frame:	DS-416 480V 1600A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1600A		
Plug:			

Setting:			
1) LTPU	0.5	(800A)	
2) LTD	4.0		
3) STPU	4.0	(6400A)	
4) STD	0.18		
5) INST	4.0	(6400A)	



TCC Name: 1A-002
Oneline: 1A-002-LEE 1
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

Project Name: SUNY-OSWEGO April 2013(Base Project)
TCC Name: 1A-002.1.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	LEE-FU-1	TCC Name:	1A-002.1.tcc
Bus Name:	1A.01A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	WESTINGHOUSE		
Description:	20-80A		
Type:	CLE 15.5KV		
AIC Rating:	50kA	Fault Duty:	2406.4A
Cartridge:	CLE 15500V 40A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	40A		

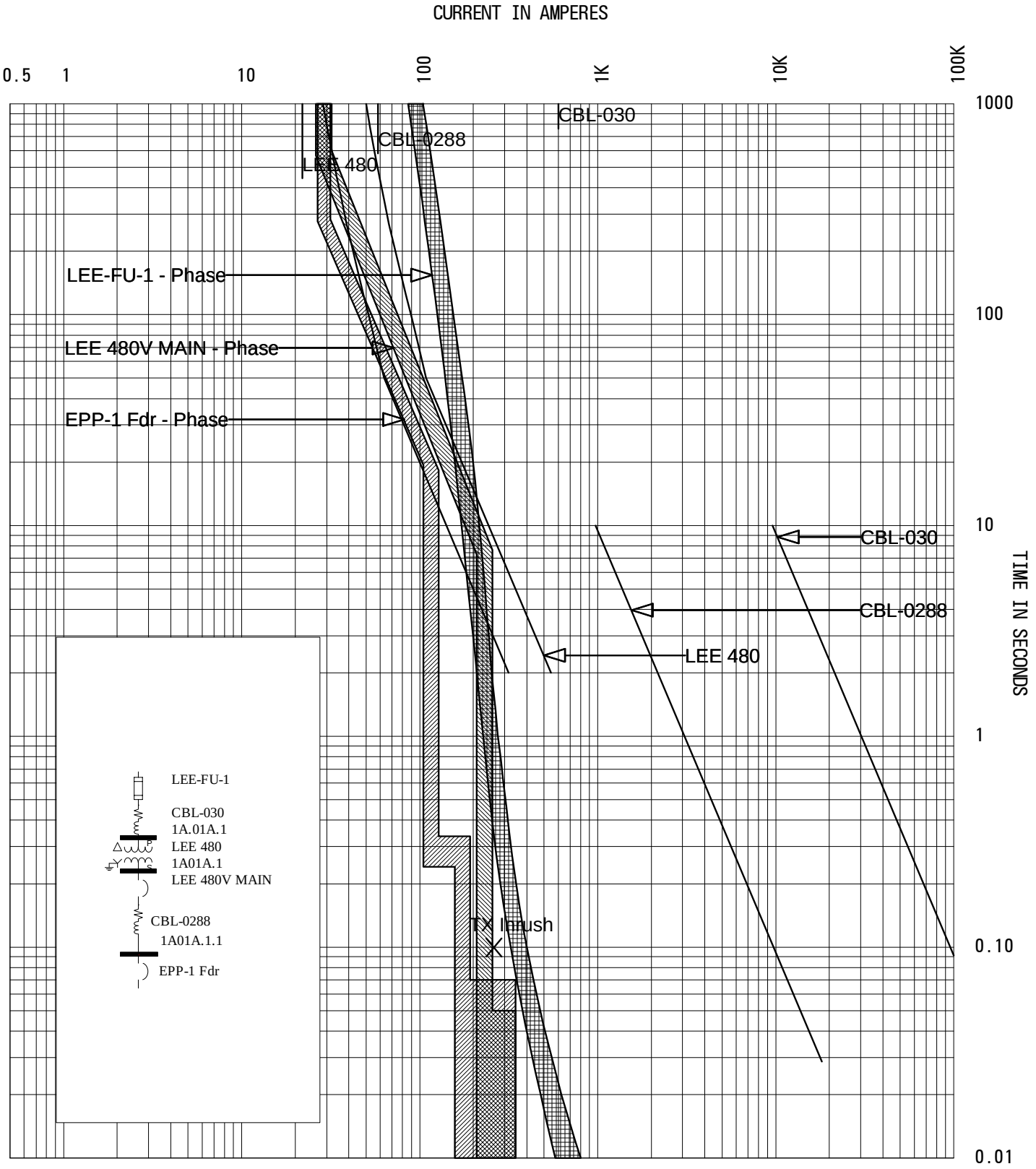
Device Name:	CBL-030	TCC Name:	1A-002.1.tcc
Bus Name:	1A.01A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	LEE 480	TCC Name:	1A-002.1.tcc
Bus Name:	1A.01A.1	Bus Voltage:	13200.0V / 480V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/480 LL
Nominal Size:	500.0kVA		
Impedance (%Z):	5.4100	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	LEE 480V MAIN			TCC Name:	1A-002.1.tcc
Bus Name:	1A01A.1			Bus Voltage:	480.0V
Function Name:	Phase				
Manufacturer:	WESTINGHOUSE				
Description:	AMPTECT IA				
Type:	DS				
AIC Rating:	50kA			Fault Duty:	9522.3A
Frame:	DS-416 480V 1600A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Sensor:	1600A				
Plug:					
Setting:	1) LTPU	0.5	(800A)		
	2) LTD	4.0			
	3) STPU	4.0	(6400A)		
	4) STD	0.18			
	5) INST	4.0	(6400A)		

Device Name:	EPP-1 Fdr			TCC Name:	1A-002.1.tcc
Bus Name:	1A01A.1.1			Bus Voltage:	480.0V
Function Name:	Phase				
Manufacturer:	CUTLER-HAMMER				
Description:	LSI, 200-5000A				
Type:	DS, RMS 510/610/810/910				
AIC Rating:	30kA ShortTime:30			Fault Duty:	9501.0A
Frame:	DS-206 480V 800A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Sensor:	800A				
Plug:	800A				
Setting:	1) LTPU (0.5-1.0 x P)	1	(800A)		
	2) LTD (2-24 Sec.)	10			
	3) STPU (2-10 x LTPU)	4	(3200A)		
	4) STD (0.1-0.5 Sec.)	0.3 Sec.	I^2 t Out		
	5) INST (2-12 x P)	6	(4800A)		

Device Name:	CBL-0288	TCC Name:	1A-002.1.tcc
Bus Name:	1A01A.1	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1600	Cont. Temp:	75 deg C.
Material:	Copper	Damage Temp:	150 deg C.



TCC Name: 1A-002.1
Oneline: 1A-002.1 - LEE 480V MAIN
June 24, 2013 2:15 PM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

Project Name: SUNY-OSWEGO April 2013(Base Project)
TCC Name: 1A-002.2.tcc
Reference Voltage: 480 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	CBL-0281	TCC Name:	1A-002.2.tcc
Bus Name:	1A01A.1.3	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	2
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	CBL-0287	TCC Name:	1A-002.2.tcc
Bus Name:	1A01A.1.1	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	2
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	EPP-1 Fdr	TCC Name:	1A-002.2.tcc
Bus Name:	1A01A.1.1	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	30kA ShortTime:30	Fault Duty:	9501.0A
Frame:	DS-206 480V 800A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	800A		
Plug:	800A		

Setting: 1) LTPU (0.5-1.0 x P)	1	(800A)	
2) LTD (2-24 Sec.)	10		
3) STPU (2-10 x LTPU)	4	(3200A)	
4) STD (0.1-0.5 Sec.)	0.3 Sec.	I^2 t Out	
5) INST (2-12 x P)	6	(4800A)	

Device Name:	CBL-0288	TCC Name:	1A-002.2.tcc
Bus Name:	1A01A.1	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1600	Cont. Temp:	75 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	PP-4 Fdr	TCC Name:	1A-002.2.tcc
Bus Name:	1A01A.1.4	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	100-400A		
Type:	HKD		
AIC Rating:	65kA	Fault Duty:	8812.2A
Frame:	HKD 480V 400A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	400A		

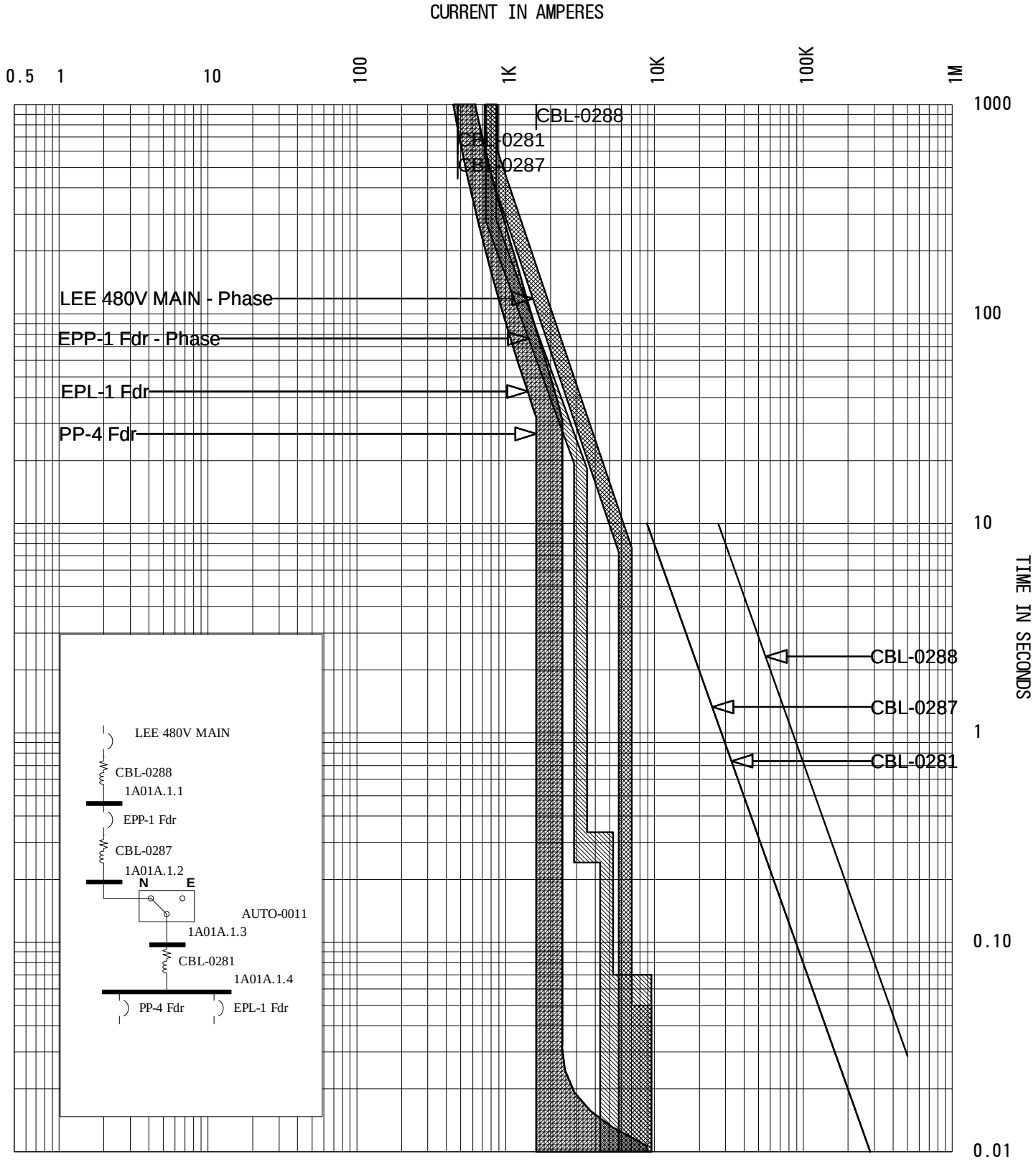
Setting: 1) Thermal Curve (Fixed
2) INST (5-10 x Trip) 5 (2000A)

Device Name:	EPL-1 Fdr	TCC Name:	1A-002.2.tcc
Bus Name:	1A01A.1.4	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	100-400A		
Type:	HKD		
AIC Rating:	65kA	Fault Duty:	8812.2A
Frame:	HKD 480V 400A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	400A		

Setting: 1) Thermal Curve (Fixed
2) INST (5-10 x Trip) 5 (2000A)

Device Name:	LEE 480V MAIN	TCC Name:	1A-002.2.tcc
Bus Name:	1A01A.1	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	WESTINGHOUSE		
Description:	AMPTECT IA		
Type:	DS		
AIC Rating:	50kA	Fault Duty:	9522.3A
Frame:	DS-416 480V 1600A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1600A		
Plug:			

Setting: 1) LTPU	0.5	(800A)	
2) LTD	4.0		
3) STPU	4.0	(6400A)	
4) STD	0.18		
5) INST	4.0	(6400A)	



TCC Name: 1A-002.2
Oneline: 1A-002.2 - LEE EPP1 FDR
June 24, 2013 2:15 PM

Current Scale x 1

Reference Voltage: 480
SUNY OSWEGO
35kV SUB EXPANSION

Project Name: SUNY-OSWEGO April 2013(Base Project)
TCC Name: 1A-002.3.tcc
Reference Voltage: 480 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	CBL-0281	TCC Name:	1A-002.3.tcc
Bus Name:	1A01A.1.3	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	2
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	CBL-0287	TCC Name:	1A-002.3.tcc
Bus Name:	1A01A.1.1	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	2
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	EPP-1 Fdr	TCC Name:	1A-002.3.tcc
Bus Name:	1A01A.1.1	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	30kA ShortTime:30	Fault Duty:	9501.0A
Frame:	DS-206 480V 800A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	800A		
Plug:	800A		

Setting: 1) LTPU (0.5-1.0 x P)	1	(800A)	
2) LTD (2-24 Sec.)	10		
3) STPU (2-10 x LTPU)	4	(3200A)	
4) STD (0.1-0.5 Sec.)	0.3 Sec.	I^2 t Out	
5) INST (2-12 x P)	6	(4800A)	

Device Name:	PP-4 Fdr	TCC Name:	1A-002.3.tcc
Bus Name:	1A01A.1.4	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	100-400A		
Type:	HKD		
AIC Rating:	65kA	Fault Duty:	8812.2A
Frame:	HKD 480V 400A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	400A		

Setting: 1) Thermal Curve (Fixed
2) INST (5-10 x Trip) 5 (2000A)

Device Name:	EPL-1 Fdr	TCC Name:	1A-002.3.tcc
Bus Name:	1A01A.1.4	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	100-400A		
Type:	HKD		
AIC Rating:	65kA	Fault Duty:	8812.2A
Frame:	HKD 480V 400A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	400A		

Setting: 1) Thermal Curve (Fixed
2) INST (5-10 x Trip) 5 (2000A)

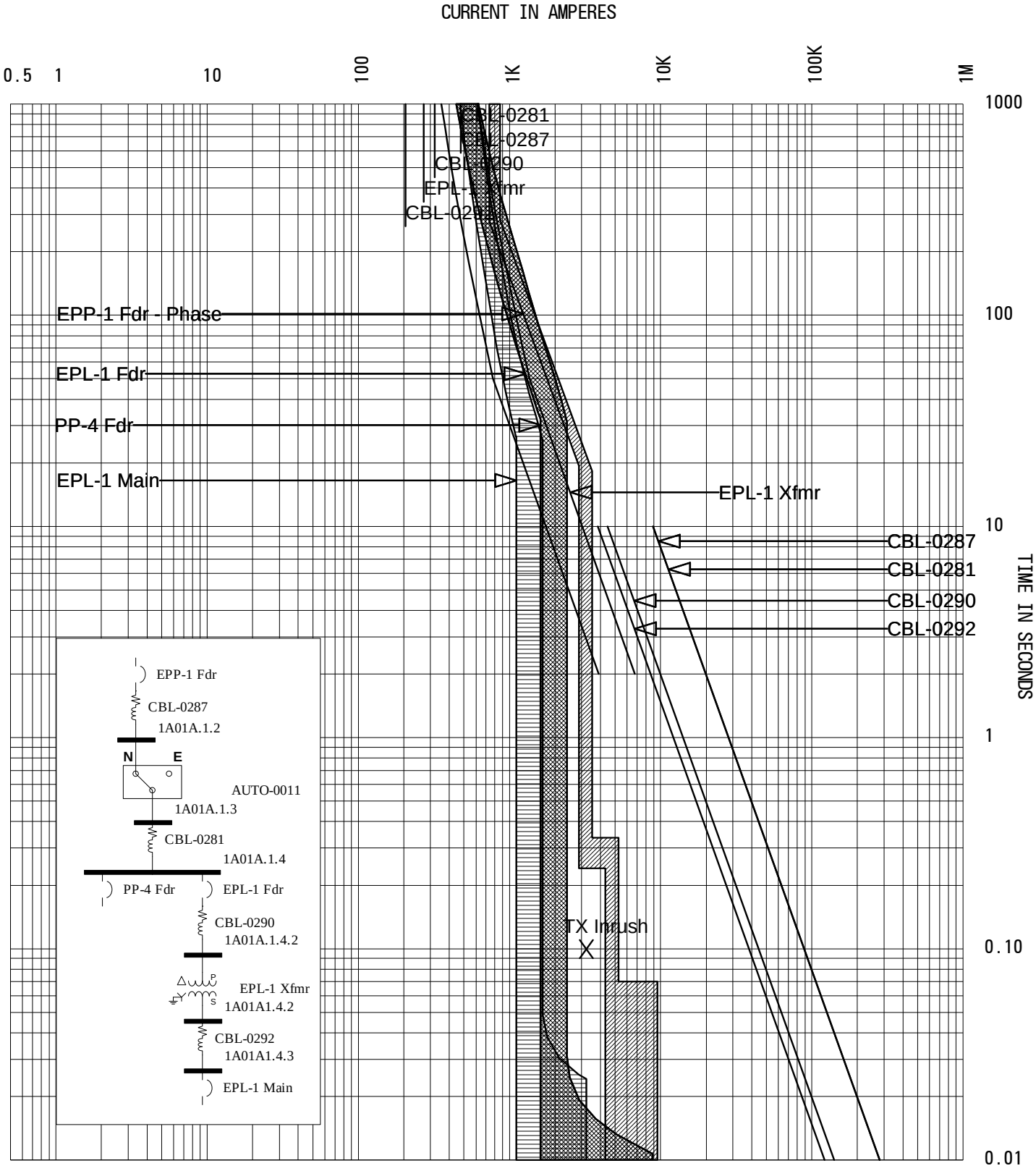
Device Name:	EPL-1 Xfmr	TCC Name:	1A-002.3.tcc
Bus Name:	1A01A.1.4.2	Bus Voltage:	480.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	480 LL/208 LL
Nominal Size:	225.0kVA		
Impedance (%Z):	5.1700	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	CBL-0290	TCC Name:	1A-002.3.tcc
Bus Name:	1A01A.1.4	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	300	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	CBL-0292	TCC Name:	1A-002.3.tcc
Bus Name:	1A01A1.4.2	Bus Voltage:	208.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	2
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	EPL-1 Main	TCC Name:	1A-002.3.tcc
Bus Name:	1A01A1.4.3	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	300-800A		
Type:	MDLB		
AIC Rating:	65kA	Fault Duty:	7444.0A
Frame:	MDLB 240V 800A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	800A		

Setting: 1) Thermal Curve (Fixed
2) INST (4-8 x Trip) 4 (3200A)



TCC Name: 1A-002.3
Oneline: 1A-002.3 - LEE EPL1 FDR
June 24, 2013 2:15 PM

Current Scale x 1

Reference Voltage: 480
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Lee Hall #2 Transformer Primary Overcurrent Device
LEE-FU-2

TCC: 1A-003

Existing Device: (W) CLE-25A (Estimated)

Transformer: 300 kVA, 13.2 – 208Y/120V, 5.40 % Z
13.1 FLA @ 13.2kV, 833 FLA @ 208V

Fuse

Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 13.1 x 3 = 39.4
Set not less than secondary device 800 x (208 / 13200) = 12.6
Confirm set as 25A
Fuse for 25A

Project Name: SUNY-OSWEGO April 2013
TCC Name: 1A-003.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	1A-50/51	TCC Name:	1A-003.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB1A	TCC Name:	1A-003.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-026	TCC Name:	1A-003.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

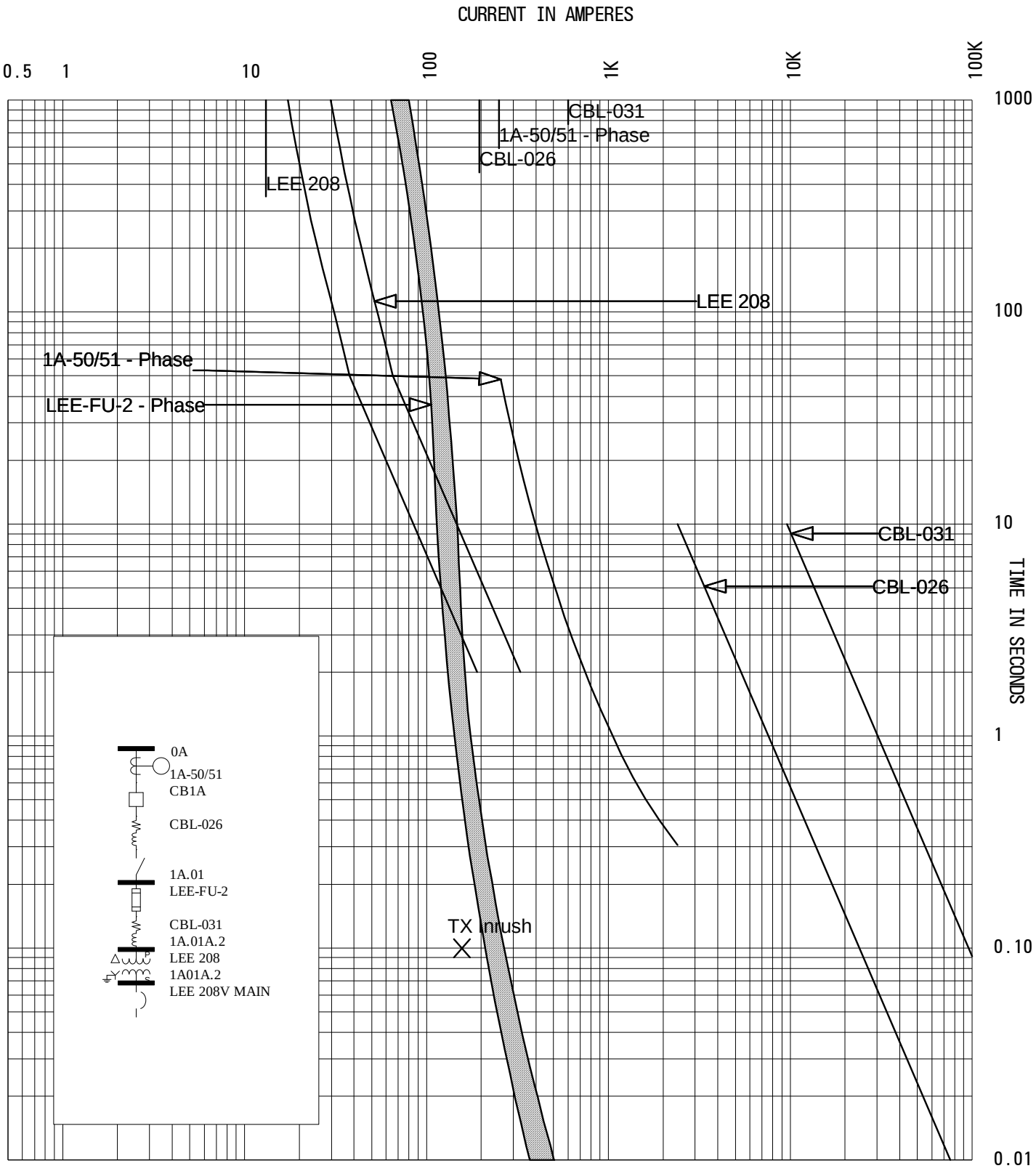
Device Name:	PD-0381	TCC Name:	1A-003.tcc
Bus Name:	1A.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2411.4A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

Device Name:	LEE-FU-2	TCC Name:	1A-003.tcc
Bus Name:	1A.01A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	WESTINGHOUSE		
Description:	20-80A		
Type:	CLE 15.5KV		
AIC Rating:	50kA	Fault Duty:	2406.4A
Cartridge:	CLE 15500V 25A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	25A		

Device Name:	CBL-031	TCC Name:	1A-003.tcc
Bus Name:	1A.01A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	LEE 208	TCC Name:	1A-003.tcc
Bus Name:	1A.01A.2	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	300.0kVA		
Impedance (%Z):	5.4000	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	LEE 208V MAIN	TCC Name:	1A-003.tcc
Bus Name:	1A01A.2	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	14014.1A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			
Setting:			



TCC Name: 1A-003
Oneline: 1A-003 - LEE 2
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Riggs Hall Transformer Primary Overcurrent Device
RIGGS-VISTA

TCC: 1A-004

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 500/667 kVA, 13.2 – 208Y/120V, 5.96 % Z
29 FLA @ 13.2kV, 1851 FLA @ 208V

Fuse

Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 29 x 3 = 87
Set not less than secondary main device 1200 x (208 / 13200) = 19
Set for E Curve 50E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 1A-004.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	1A-50/51	TCC Name:	1A-004.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB1A	TCC Name:	1A-004.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-026	TCC Name:	1A-004.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0385	TCC Name:	1A-004.tcc
Bus Name:	1A.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2304.2A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

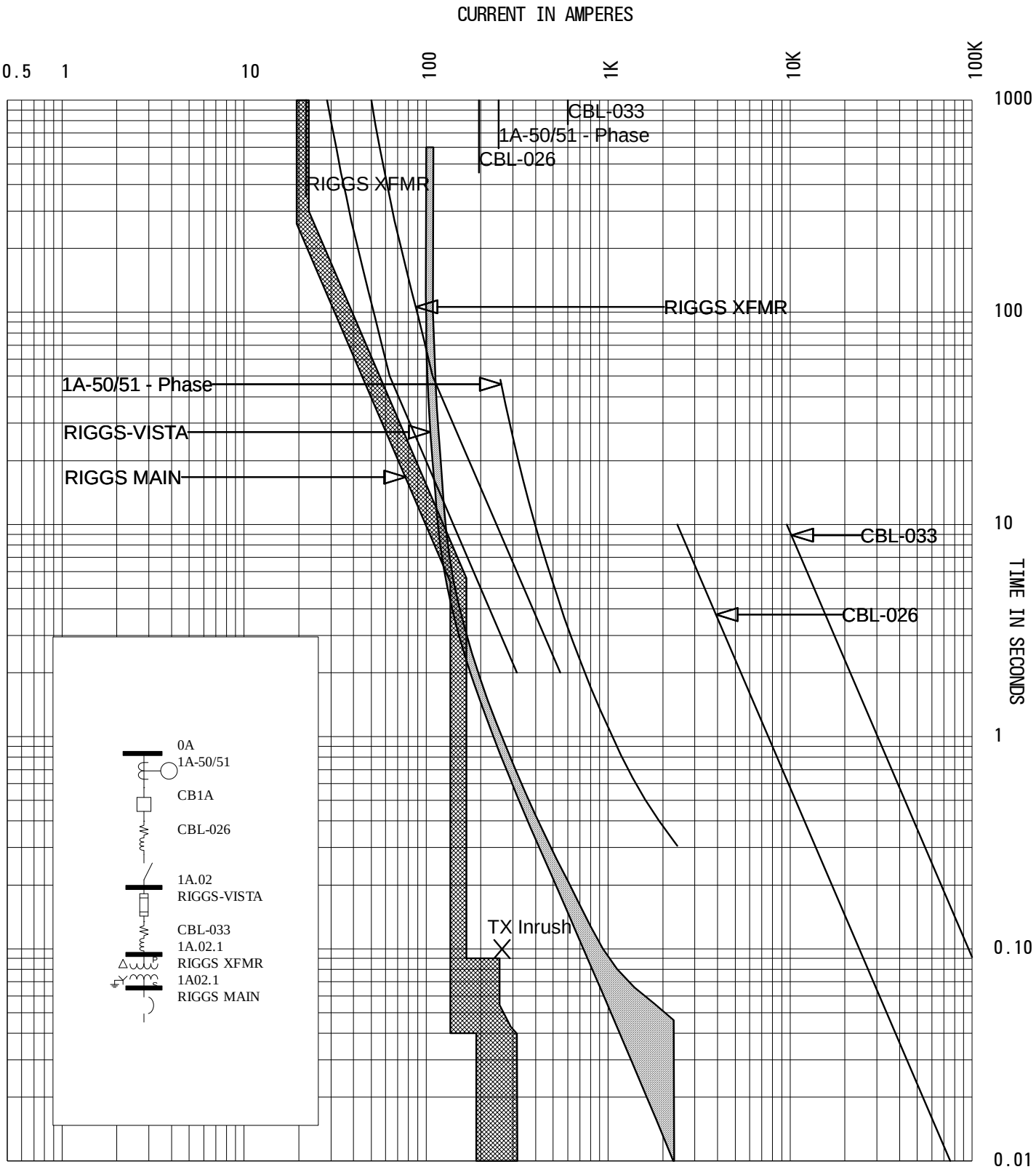
Device Name:	RIGGS-VISTA	TCC Name:	1A-004.tcc
Bus Name:	1A.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2304.2A
Cartridge:	Vista, 50E 15500V 50A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	50A		

Device Name:	CBL-033	TCC Name:	1A-004.tcc
Bus Name:	1A.02	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	RIGGS XFMR	TCC Name:	1A-004.tcc
Bus Name:	1A.02.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	500.0kVA		
Impedance (%Z):	5.9600	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	RIGGS MAIN	TCC Name:	1A-004.tcc
Bus Name:	1A02.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LS, 400-1200A Fixed Plug		
Type:	CHND, RMS 310		
AIC Rating:	100kA	Fault Duty:	20087.7A
Frame:	CHND 240V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1200A		
Plug:	1200A		

Setting: 1) LTPU (1.0 x P)	Fixed	(1200A)	
2) LTD (Fixed)	Fixed		
3) STPU (2-8 x P)	8	(9600A)	
4) STD (Fixed)	Fixed	I^2 t Out	
5) INST (14000A)	Fixed	(14000A)	



TCC Name: 1A-004
Oneline: 1A-004-Riggs
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Johnson Hall Transformer Primary Overcurrent Device
JOHNSON-VISTA

TCC: 1A-001, 005

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 1000 kVA, 13.2 – 208Y/120V, 6.13% Z
43.7 FLA @ 13.2kV, 2776 FLA @ 208V

Fuse

Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 43.7 x 3 = 131.2
Set not less than secondary main device 4000 x (208 / 13200) = 63
Set for E Curve 80E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 1A-005.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	1A-50/51	TCC Name:	1A-005.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB1A	TCC Name:	1A-005.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-026	TCC Name:	1A-005.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0388	TCC Name:	1A-005.tcc
Bus Name:	1A.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2278.2A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

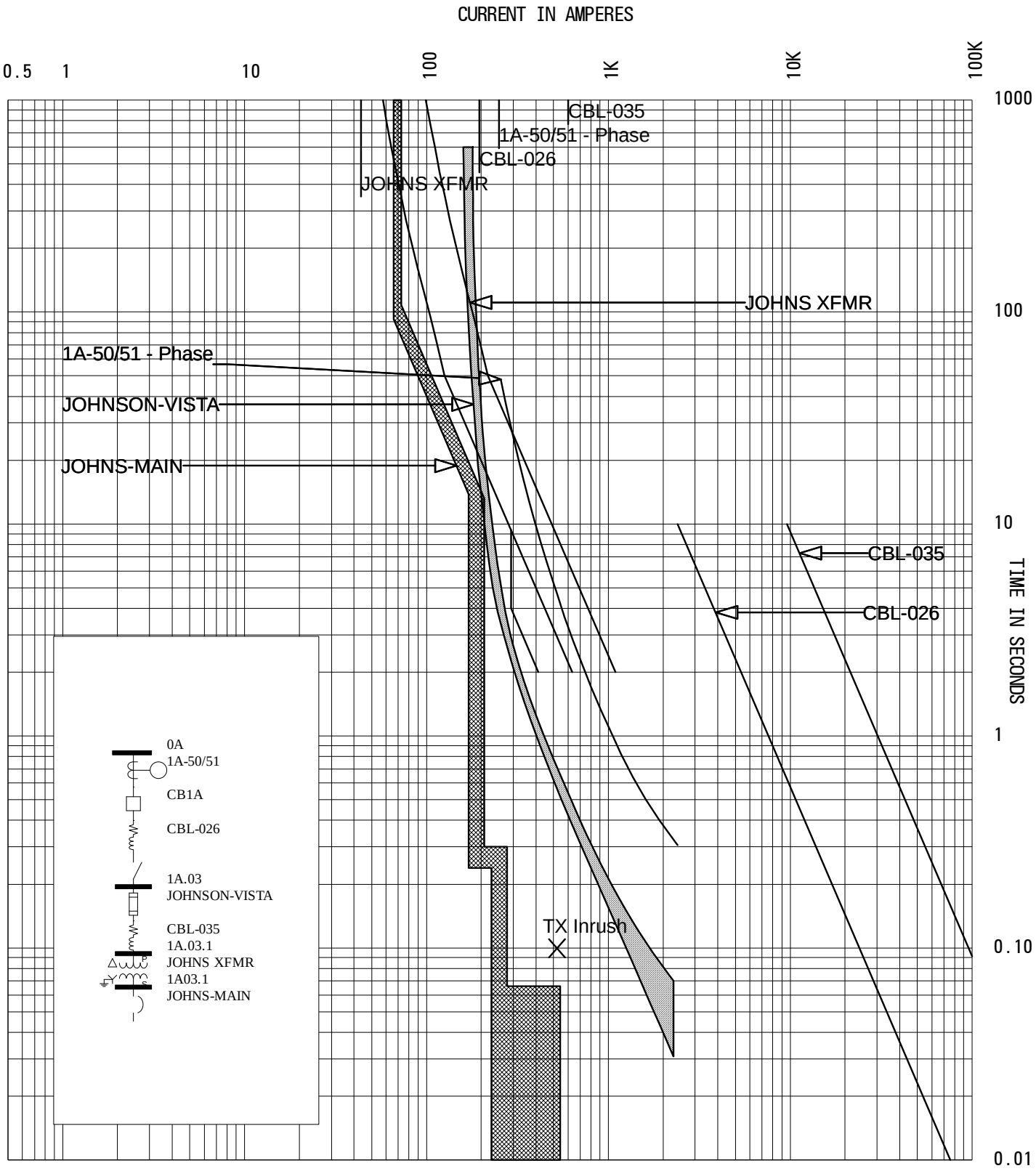
Device Name:	JOHNSON-VISTA	TCC Name:	1A-005.tcc
Bus Name:	1A.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2278.2A
Cartridge:	Vista, 80E 15500V 80A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	80A		

Device Name:	CBL-035	TCC Name:	1A-005.tcc
Bus Name:	1A.03	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	JOHNS XFMR	TCC Name:	1A-005.tcc
Bus Name:	1A.03.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	1000.0kVA		
Impedance (%Z):	6.1300	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	JOHNS-MAIN	TCC Name:	1A-005.tcc
Bus Name:	1A03.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 4000AF, 3200-4000A Plugs		
Type:	Magnum DS, RMS 520		
AIC Rating:	85kA ShortTime:85	Fault Duty:	34486.2A
Frame:	MDS-840 480V 4000A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	4000A		
Plug:	4000A		

Setting: 1) LTPU (0.4-1.0 x P)	1	(4000A)	
2) LTD (2-24 Sec.)	4		
3) STPU (2-12 x LTPU)	3	(12000A)	
4) STD (0.1-0.5 Sec.)	0.3	I^2 t Out	
5) INST (2-12 x P)	4	(16000A)	



TCC Name: 1A-005
Oneline: 1A-005 - Johnson
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Lakeside Dining Hall Transformer Primary Overcurrent Device
LAKE VISTA

TCC: 1A-006

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 500 kVA, 13.2 – 208Y/120V (Impedance not listed)
21.9 FLA @ 13.2kV, 601 FLA @ 480V

Fuse
Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 21.9 x 3 = 65.6
Set not less than secondary main device 1200 x (208 / 13200) = 19
Set for E Curve 50E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 1A-006.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	1A-50/51	TCC Name:	1A-006.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB1A	TCC Name:	1A-006.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-026	TCC Name:	1A-006.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0392	TCC Name:	1A-006.tcc
Bus Name:	1A.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2262.6A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

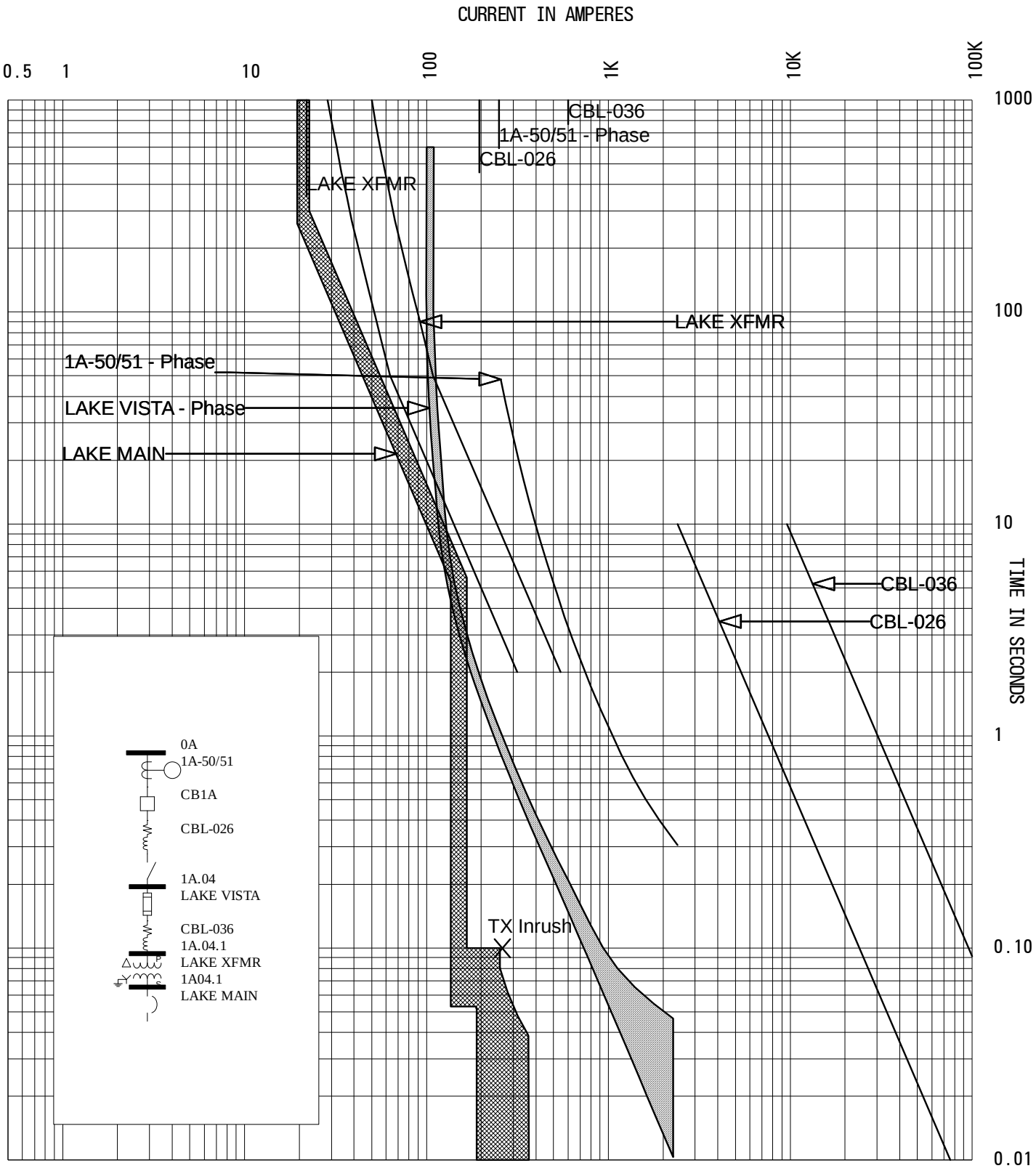
Device Name:	LAKE VISTA	TCC Name:	1A-006.tcc
Bus Name:	1A.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2262.6A
Cartridge:	Vista, 50E 15500V 50A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	50A		

Device Name:	CBL-036	TCC Name:	1A-006.tcc
Bus Name:	1A.04	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	LAKE XFMR	TCC Name:	1A-006.tcc
Bus Name:	1A.04.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	500.0kVA		
Impedance (%Z):	5.0000	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	LAKE MAIN	TCC Name:	1A-006.tcc
Bus Name:	1A04.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 400-1200A Fixed Plug		
Type:	CHND, RMS 310		
AIC Rating:	100kA	Fault Duty:	23260.7A
Frame:	CHND 240V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1200A		
Plug:	1200A		

Setting: 1) LTPU (1.0 x P)	Fixed	(1200A)	
2) LTD (Fixed)	Fixed		
3) STPU (2-8 x P)	8	(9600A)	
4) STD (Inst-300 ms)	100 ms	I^2 t Out	
5) INST (14000A)	Fixed	(14000A)	



TCC Name: 1A-006
Oneline: 1A-006-Lakeside
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Waterbury Hall Transformer Primary Overcurrent Device
WATER-VISTA

TCC: 1B-001, 002

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 225 kVA, 13.2 – 208Y/120V, 5.7 % Z
9.8FLA @ 13.2kV, 624.5 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 9.8 x 3 = 29.5
Set not less than secondary main device 800 x (208 / 13200) = 12.6
Set for E Curve 25E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 1B-001.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	CBL-003	TCC Name:	1B-001.tcc
Bus Name:	0.1.2	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1200	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	Main B	TCC Name:	1B-001.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	BUS B 50/51	TCC Name:	1B-001.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	1200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	0.43 (516A)	Test Points:	@2.0X, 3.838s
2) Ext Inverse	2.2 1		@5.0X, 0.544s
			@10.0X, 0.216s

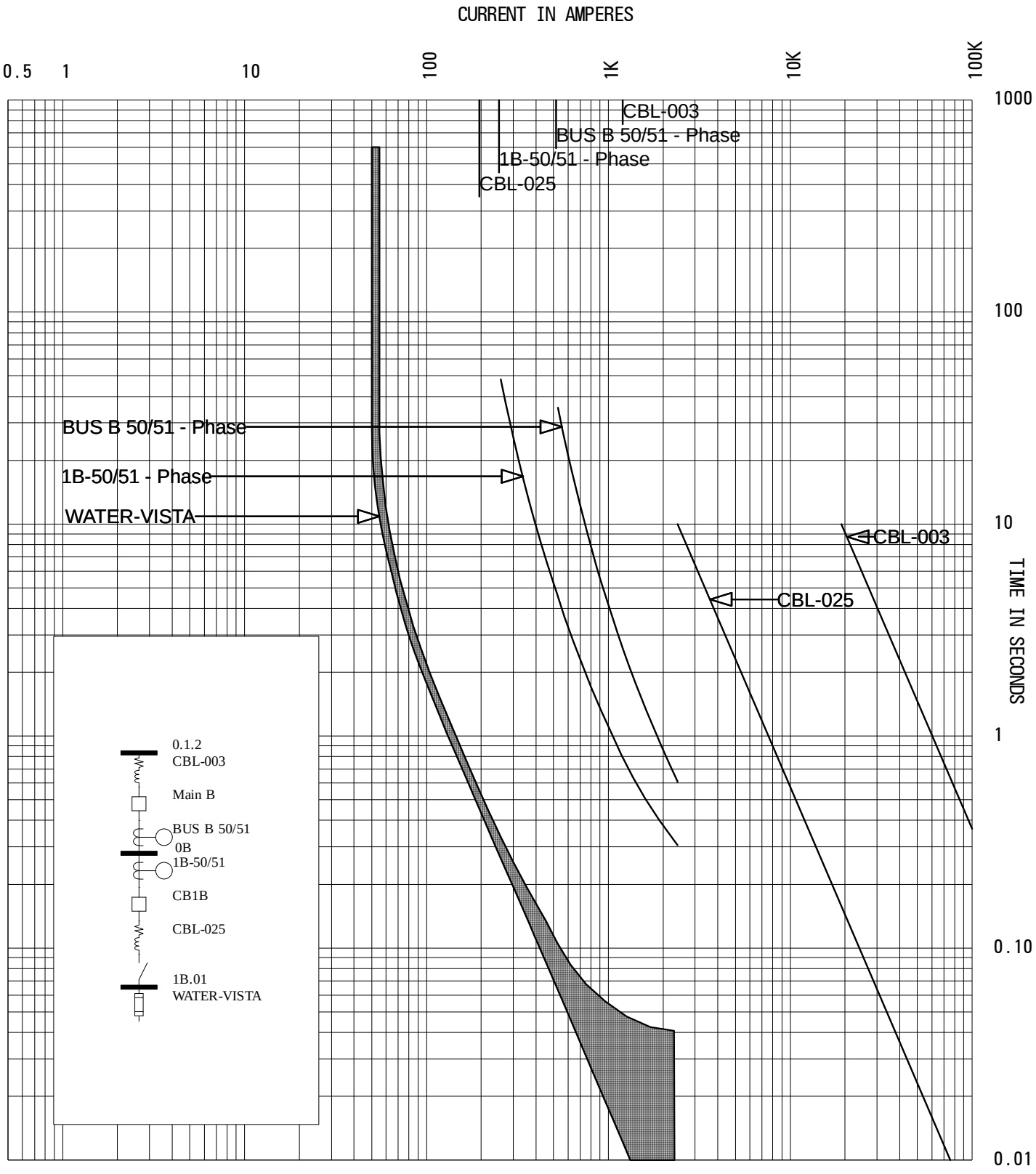
Device Name: 1B-50/51 TCC Name: 1B-001.tcc
Bus Name: 0B Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 2414.8A
Current Rating: 200A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 1.25 (250A) Test Points: @2.0X, 5.233s
2) Ext Inverse 3 1 @5.0X, 0.742s
@10.0X, 0.295s

Device Name: CB1B TCC Name: 1B-001.tcc
Bus Name: 0B Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: CUTLER-HAMMER
Description: 600-3000A
Type: VCP-W
AIC Rating: 18kA Fault Duty: 2414.8A
Frame: 150 VCP-W-500 15000V 1200A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Sensor:
Plug:

Device Name: CBL-025 TCC Name: 1B-001.tcc
Bus Name: 0B Bus Voltage: 13200.0V
Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Description: Cable Damage Curve Qty/Ph: 1
Size: 1/0 Cont. Temp: 90 deg C.
Material: Copper Damage Temp: 250 deg C.

Device Name: PD-0371 TCC Name: 1B-001.tcc
Bus Name: 1B.01 Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer:
Description:
Type:
AIC Rating: 0kA Fault Duty: 2302.7A
Frame: Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
FLA: 0.00A
Setting:

Device Name:	WATER-VISTA	TCC Name:	1B-001.tcc
Bus Name:	1B.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2302.7A
Cartridge:	Vista, 25E 15500V 25A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	25A		



TCC Name: 1B-001
Oneline: 1B-001 - Feeder B1
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

Project Name: SUNY-OSWEGO April 2013
TCC Name: 1B-002.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	1B-50/51	TCC Name:	1B-002.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB1B	TCC Name:	1B-002.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-025	TCC Name:	1B-002.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

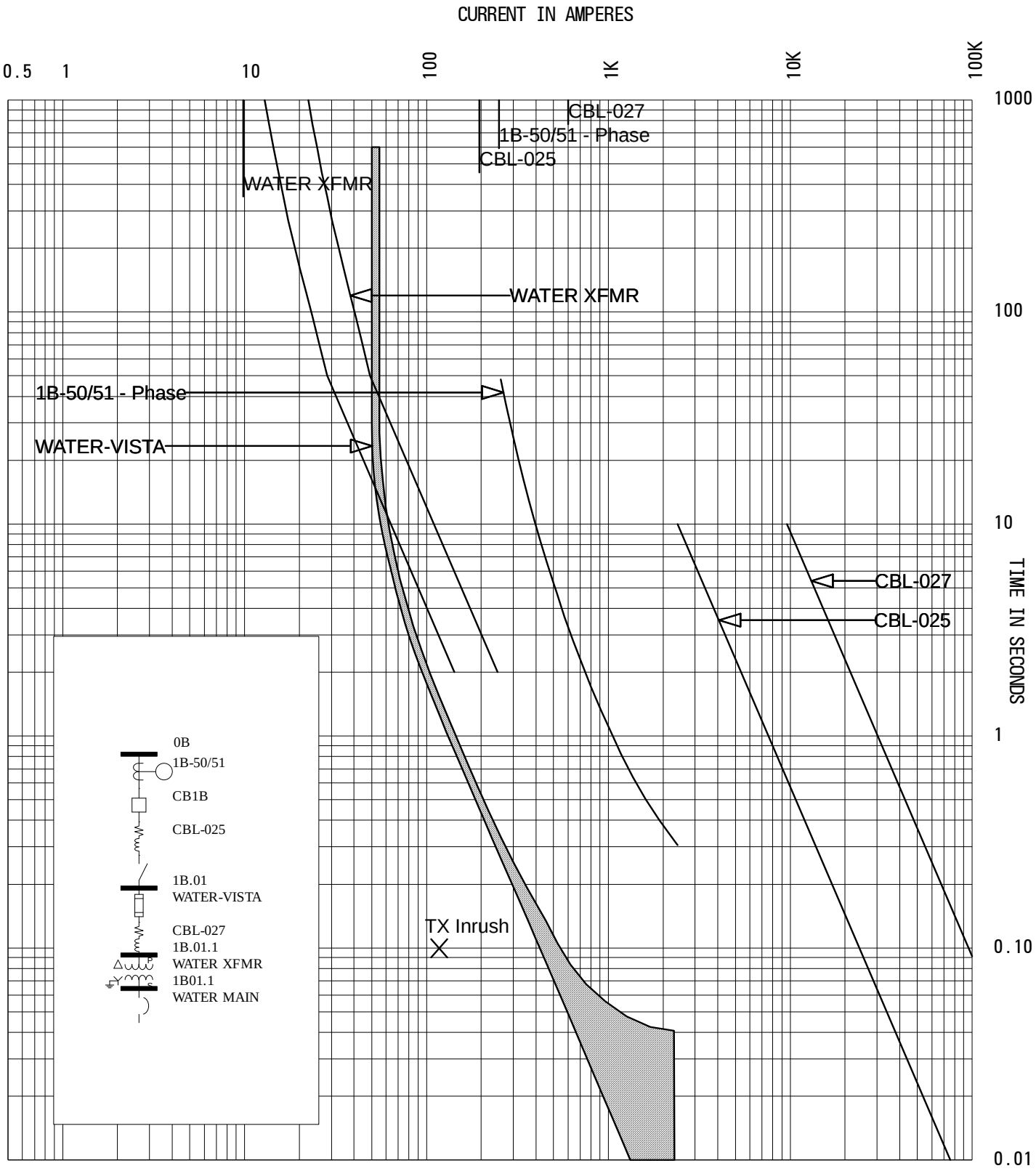
Device Name:	PD-0371	TCC Name:	1B-002.tcc
Bus Name:	1B.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2302.7A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

Device Name:	WATER-VISTA	TCC Name:	1B-002.tcc
Bus Name:	1B.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2302.7A
Cartridge:	Vista, 25E 15500V 25A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	25A		

Device Name:	CBL-027	TCC Name:	1B-002.tcc
Bus Name:	1B.01	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	WATER XFMR	TCC Name:	1B-002.tcc
Bus Name:	1B.01.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	225.0kVA		
Impedance (%Z):	5.7000	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	WATER MAIN	TCC Name:	1B-002.tcc
Bus Name:	1B01.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	10193.6A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			
Setting:			



TCC Name: 1B-002
Oneline: 1B-002 - Waterbury
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Scales Hall Transformer Primary Overcurrent Device
SCALES-VISTA

TCC: 1B-003

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 225 kVA, 13.2 – 208Y/120V, 5.68 % Z
9.8FLA @ 13.2kV, 624.5 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 9.8 x 3 = 29.5
Set not less than secondary main device 800 x (208 / 13200) = 12.6
Set for E Curve 25E

Note:
Recommend secondary main short time setting lowered from 8X to 3X. May need further review of downstream settings not in this scope.

Project Name: SUNY-OSWEGO April 2013
TCC Name: 1B-003.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	1B-50/51	TCC Name:	1B-003.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB1B	TCC Name:	1B-003.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-025	TCC Name:	1B-003.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0365	TCC Name:	1B-003.tcc
Bus Name:	1B.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2253.2A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

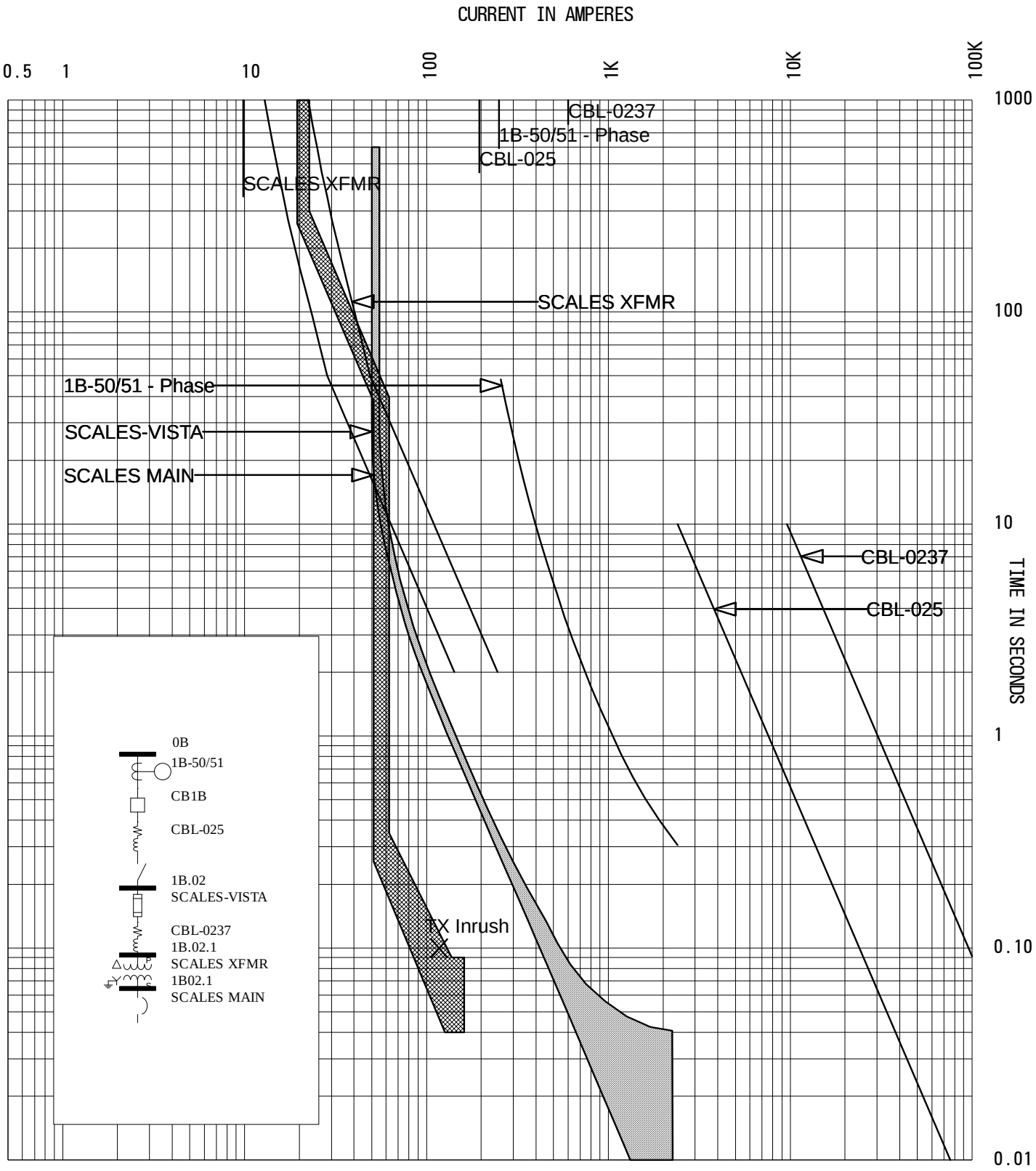
Device Name:	SCALES-VISTA	TCC Name:	1B-003.tcc
Bus Name:	1B.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2253.2A
Cartridge:	Vista, 25E 15500V 25A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	25A		

Device Name:	CBL-0237	TCC Name:	1B-003.tcc
Bus Name:	1B.02	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	SCALES XFMR	TCC Name:	1B-003.tcc
Bus Name:	1B.02.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	225.0kVA		
Impedance (%Z):	5.6800	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	SCALES MAIN	TCC Name:	1B-003.tcc
Bus Name:	1B02.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LS, 400-1200A Fixed Plug		
Type:	CHND, RMS 310		
AIC Rating:	100kA	Fault Duty:	10210.5A
Frame:	CHND 240V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1200A		
Plug:	1200A		

Setting:			
1) LTPU (1.0 x P)	Fixed	(1200A)	
2) LTD (Fixed)	Fixed		
3) STPU (2-8 x P)	3	(3600A)	
4) STD (Fixed)	Fixed	I^2 t In	
5) INST (14000A)	Fixed	(14000A)	



TCC Name: 1B-003
Oneline: 1B-003 - Scaled
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Walker Infirmary Transformer Primary Overcurrent Device
WALKER-VISTA

TCC: 1B-004

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 225 kVA, 13.2 – 208Y/120V, 5.67 % Z
9.8FLA @ 13.2kV, 624.5 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 9.8 x 3 = 29.5
Set not less than secondary main device 800 x (208 / 13200) = 12.6
Set for E Curve 25E

Note:
Recommend secondary main short time setting lowered from 8X to 3X. May need further review of downstream settings not in this scope.

Project Name: SUNY-OSWEGO April 2013
TCC Name: 1B-004.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	1B-50/51	TCC Name:	1B-004.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB1B	TCC Name:	1B-004.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-025	TCC Name:	1B-004.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0378	TCC Name:	1B-004.tcc
Bus Name:	1B.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2235.0A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

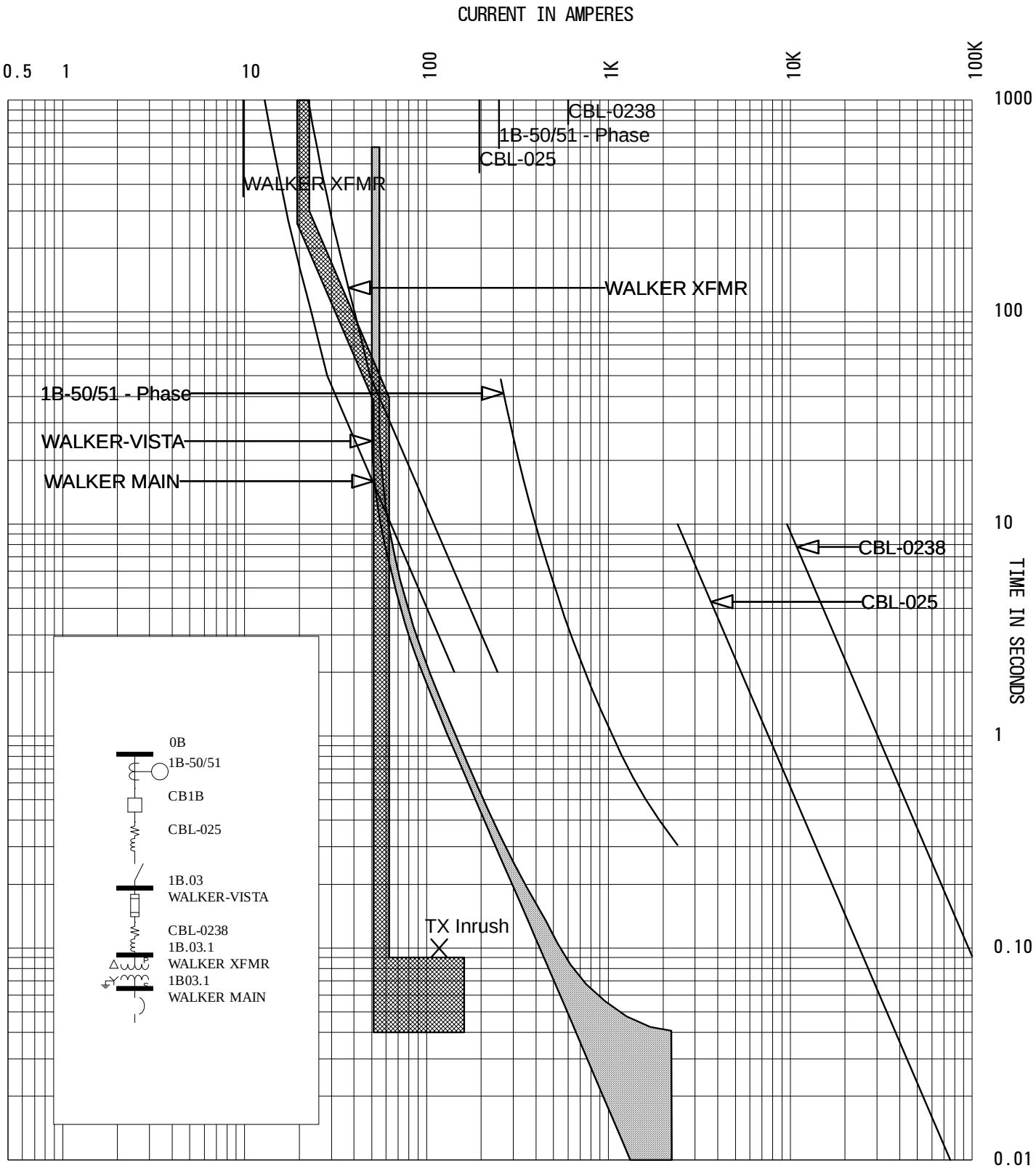
Device Name:	WALKER-VISTA	TCC Name:	1B-004.tcc
Bus Name:	1B.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2235.0A
Cartridge:	Vista, 25E 15500V 25A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	25A		

Device Name:	CBL-0238	TCC Name:	1B-004.tcc
Bus Name:	1B.03	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	WALKER XFMR	TCC Name:	1B-004.tcc
Bus Name:	1B.03.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	225.0kVA		
Impedance (%Z):	5.6700	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	WALKER MAIN	TCC Name:	1B-004.tcc
Bus Name:	1B03.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LS, 400-1200A Fixed Plug		
Type:	CHND, RMS 310		
AIC Rating:	100kA	Fault Duty:	10221.1A
Frame:	CHND 240V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1200A		
Plug:	1200A		

Setting: 1) LTPU (1.0 x P)	Fixed	(1200A)	
2) LTD (Fixed)	Fixed		
3) STPU (2-8 x P)	3	(3600A)	
4) STD (Fixed)	Fixed	I^2 t Out	
5) INST (14000A)	Fixed	(14000A)	



TCC Name: 1B-004
Oneline: 1B-004 - Walker
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

Project Name: SUNY-OSWEGO April 2013
TCC Name: 2A-001.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	T2-50/51	TCC Name:	2A-001.tcc
Bus Name:	0.2.1	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2505.4A
Current Rating:	1200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	0.43 (516A)	Test Points:	@2.0X, 5.756s
2) Ext Inverse	3.3 1		@5.0X, 0.816s
			@10.0X, 0.324s

Device Name:	M2	TCC Name:	2A-001.tcc
Bus Name:	0.2.1	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2505.4A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-080	TCC Name:	2A-001.tcc
Bus Name:	0.2.1	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	250	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	CBL-081	TCC Name:	2A-001.tcc
Bus Name:	0.2.2	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1200	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	Main A	TCC Name:	2A-001.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	BUS A 50/51	TCC Name:	2A-001.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	1200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	0.43 (516A)	Test Points:	@2.0X, 3.838s
2) Ext Inverse	2.2 1		@5.0X, 0.544s
			@10.0X, 0.216s

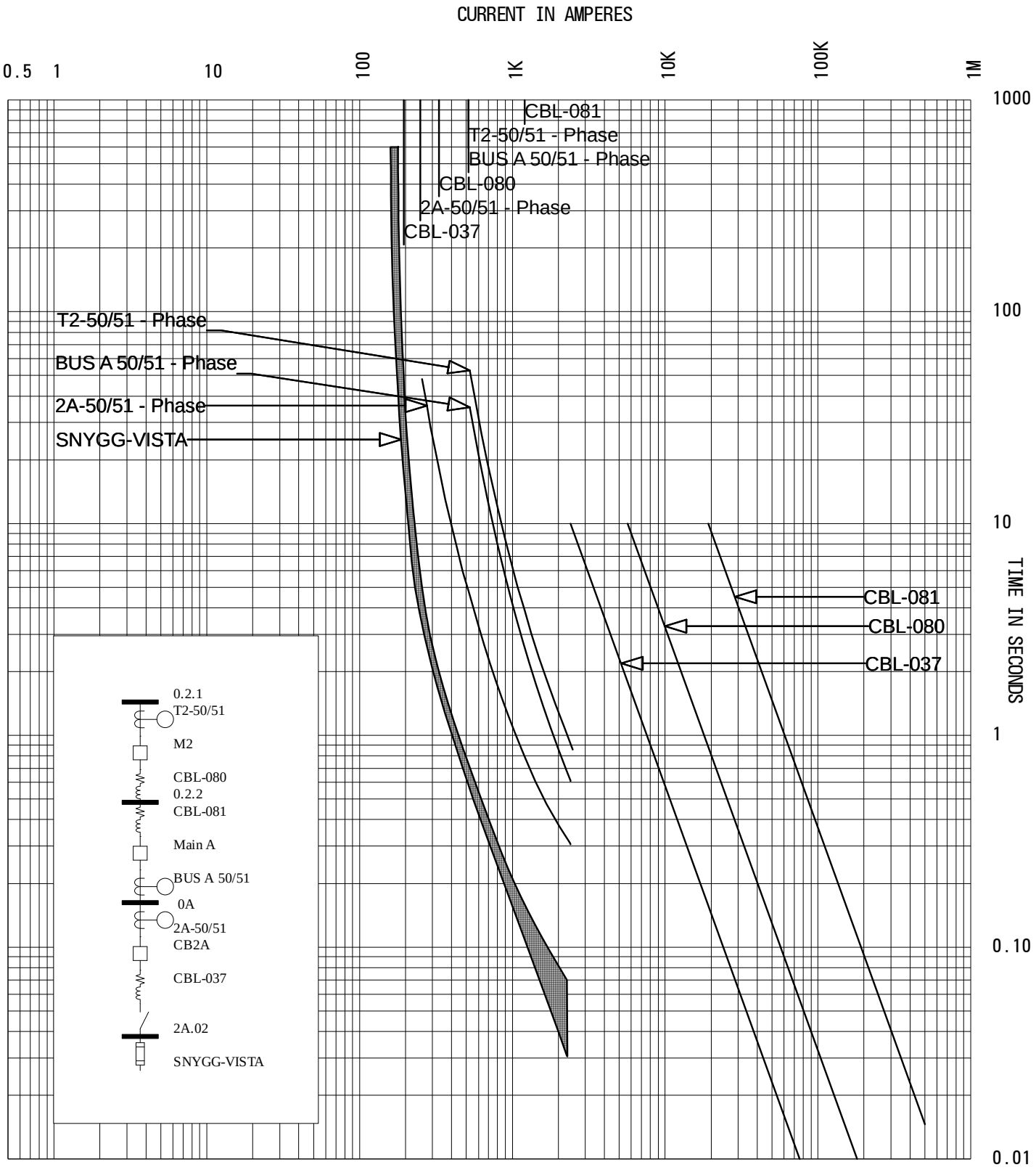
Device Name:	2A-50/51	TCC Name:	2A-001.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB2A	TCC Name:	2A-001.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-037	TCC Name:	2A-001.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0401	TCC Name:	2A-001.tcc
Bus Name:	2A.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2285.5A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

Device Name:	SNYGG-VISTA	TCC Name:	2A-001.tcc
Bus Name:	2A.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2285.5A
Cartridge:	Vista, 80E 15500V 80A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	80A		



TCC Name: 2A-001
Oneline: 2A-001 - Feeder A2
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Campus Center Transformer Primary Overcurrent Device
SWETMAN-VISTA

TCC: 2A-002

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 750 kVA, 13.2 – 208Y/120V, 5.84 % Z
32.8 FLA @ 13.2kV, 2082 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 32.8 x 3 = 98.4
Set not less than secondary main device 1200 x (208 / 13200) = 18.9
Set for E Curve 65E

Note:
Downstream main settings are 2400A frame, 2000A plug, set at 1200A (LTPU 0.6; LTD 24; STPU S1 (8); STD 0.5; INST 10X). This does not allow full use of the transformer. Recommend this be investigated and temporary settings recommended to be LTPU 1; LTD 24; STPU 4; STD 0.5 I^2t Out; Inst 8X.

Project Name: SUNY-OSWEGO April 2013
TCC Name: 2A-002.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	2A-50/51	TCC Name:	2A-002.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB2A	TCC Name:	2A-002.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-037	TCC Name:	2A-002.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0398	TCC Name:	2A-002.tcc
Bus Name:	2A.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2344.0A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

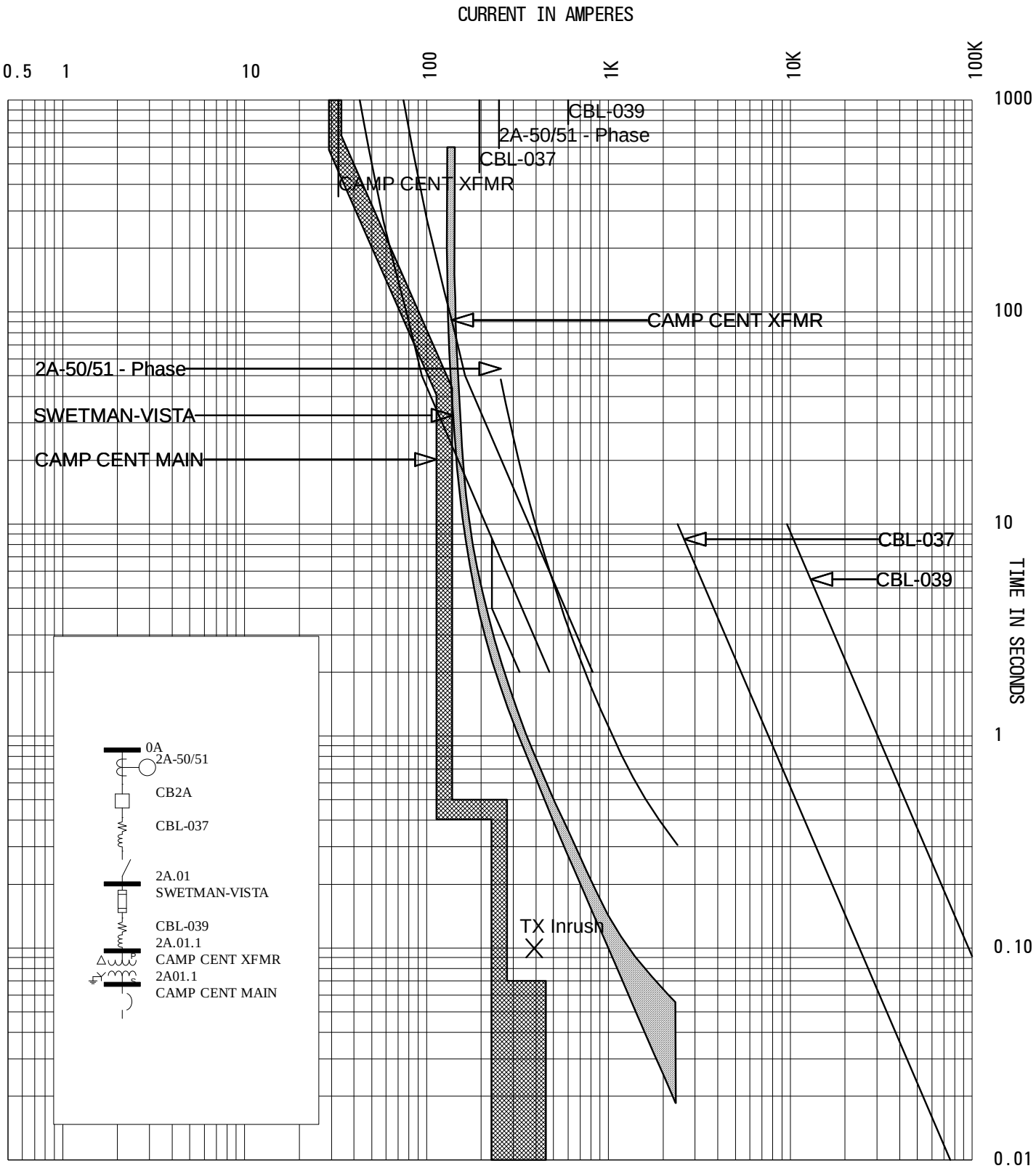
Device Name:	SWETMAN-VISTA	TCC Name:	2A-002.tcc
Bus Name:	2A.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2344.0A
Cartridge:	Vista, 65E 15500V 65A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	65A		

Device Name:	CBL-039	TCC Name:	2A-002.tcc
Bus Name:	2A.01	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	CAMP CENT XFMR	TCC Name:	2A-002.tcc
Bus Name:	2A.01.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	750.0kVA		
Impedance (%Z):	5.8400	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	CAMP CENT MAIN	TCC Name:	2A-002.tcc
Bus Name:	2A01.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	85kA ShortTime:65	Fault Duty:	28756.9A
Frame:	DS-632 240V 3200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	2400A		
Plug:	2000A		

Setting:			
1) LTPU (0.5-1.0 x P)	1	(2000A)	
2) LTD (2-24 Sec.)	24		
3) STPU (2-10 x LTPU)	4	(8000A)	
4) STD (0.1-0.5 Sec.)	0.5 Sec.	I^2 t Out	
5) INST (2-12 x P)	M1(8)	(16000A)	



TCC Name: 2A-002
Oneline: 2A-002-Swetman
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
SNYGG Hall Transformer Primary Overcurrent Device
SNYGG-VISTA

TCC: 2A-001, 003

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 1000 kVA, 13.2 – 208Y/120V (No Impedance listed)
43.7 FLA @ 13.2kV, 2776 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 43.7 x 3 = 131.2
Set for E Curve 80E

Note:
Secondary main fuse data not available.

Project Name: SUNY-OSWEGO April 2013
TCC Name: 2A-003.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	2A-50/51	TCC Name:	2A-003.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB2A	TCC Name:	2A-003.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-037	TCC Name:	2A-003.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

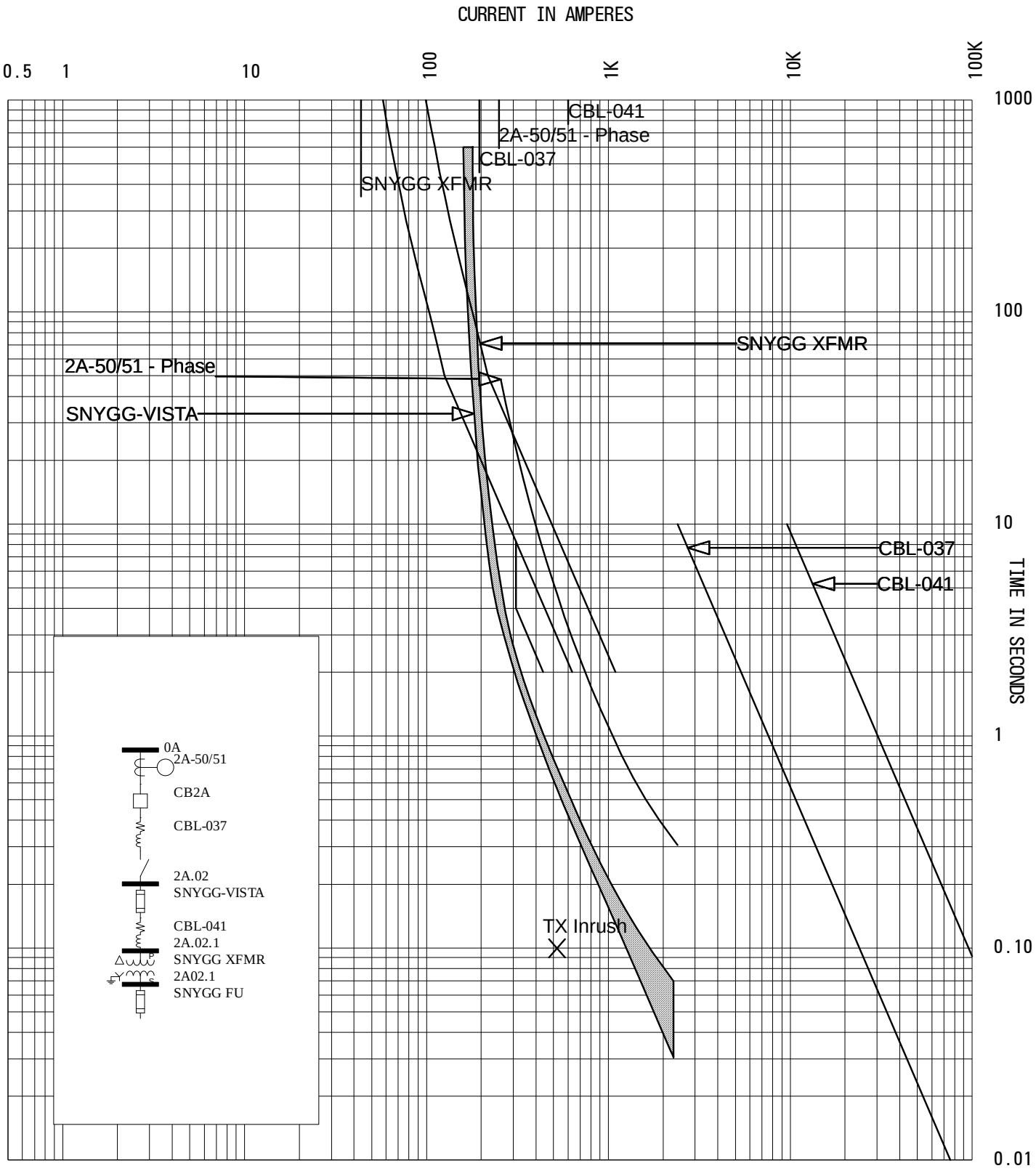
Device Name:	PD-0401	TCC Name:	2A-003.tcc
Bus Name:	2A.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2285.5A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

Device Name:	SNYGG-VISTA	TCC Name:	2A-003.tcc
Bus Name:	2A.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2285.5A
Cartridge:	Vista, 80E 15500V 80A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	80A		

Device Name:	CBL-041	TCC Name:	2A-003.tcc
Bus Name:	2A.02	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	SNYGG XFMR	TCC Name:	2A-003.tcc
Bus Name:	2A.02.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	1000.0kVA		
Impedance (%Z):	5.7500	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	SNYGG FU	TCC Name:	2A-003.tcc
Bus Name:	2A02.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	36222.7A
Cartridge:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:			



TCC Name: 2A-003	Current Scale x 1	Reference Voltage: 13200
Oneline: 2A-003 - SNYGG		SUNY OSWEGO
April 26, 2013 11:31 AM		35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Wilber Hall Transformer Primary Overcurrent Device
WILBER-VISTA

TCC: 2A-004

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 750 kVA, 13.2 – 208Y/120V, 5.82 % Z
32.8 FLA @ 13.2kV, 2082 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 32.8 x 3 = 98.4
Set not less than secondary main device 2400 x (208 / 13200) = 37.8
Set for E Curve 65E

Note:
Secondary main short time pick up (STPU) setting should be lowered from 6 to 4 for coordination.

Project Name: SUNY-OSWEGO April 2013
TCC Name: 2A-004.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	2A-50/51	TCC Name:	2A-004.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB2A	TCC Name:	2A-004.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-037	TCC Name:	2A-004.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0404	TCC Name:	2A-004.tcc
Bus Name:	2A.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2254.3A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

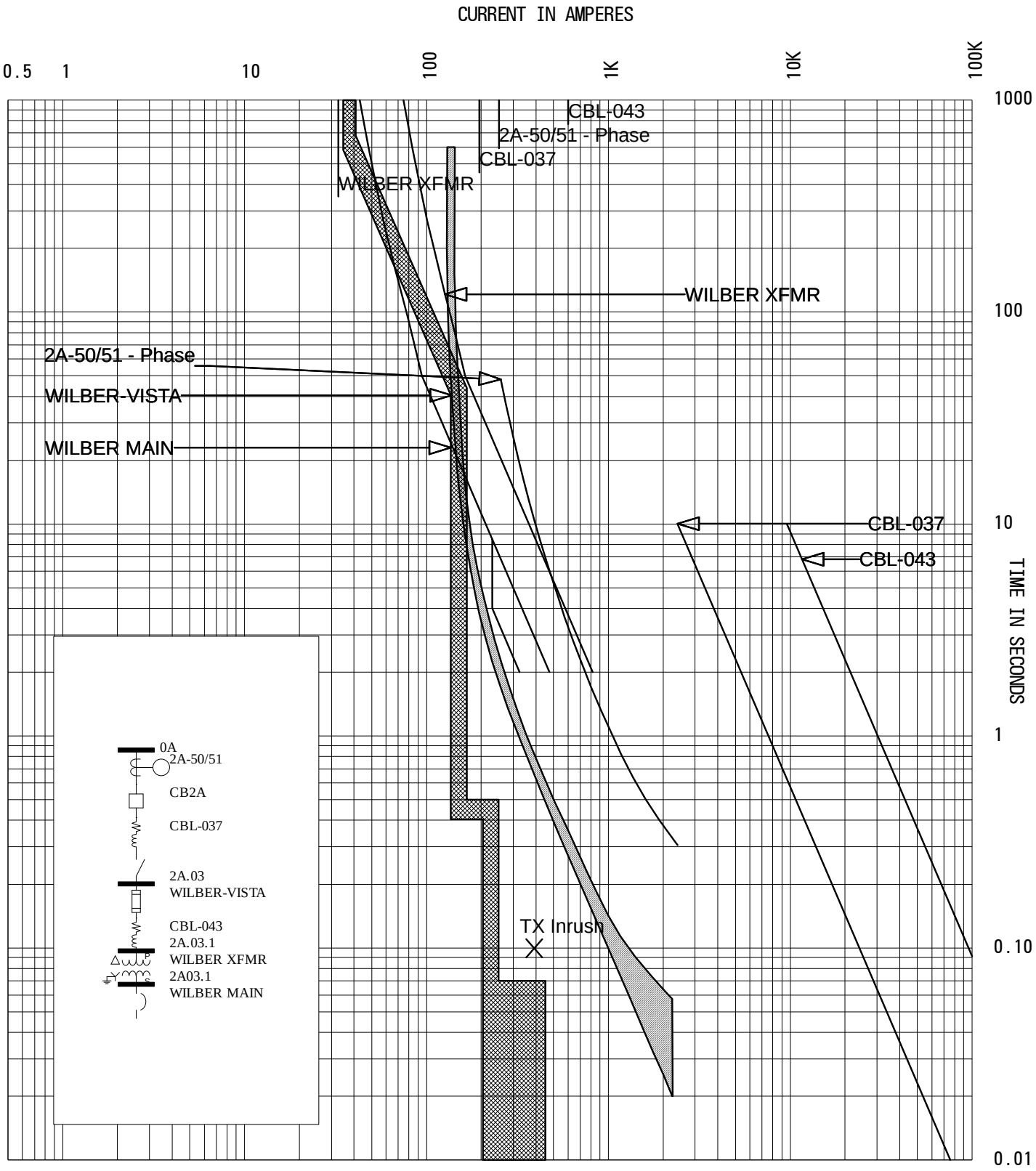
Device Name:	WILBER-VISTA	TCC Name:	2A-004.tcc
Bus Name:	2A.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2254.3A
Cartridge:	Vista, 65E 15500V 65A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	65A		

Device Name:	CBL-043	TCC Name:	2A-004.tcc
Bus Name:	2A.03	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	WILBER XFMR	TCC Name:	2A-004.tcc
Bus Name:	2A.03.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	750.0kVA		
Impedance (%Z):	5.8200	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	WILBER MAIN	TCC Name:	2A-004.tcc
Bus Name:	2A03.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	85kA ShortTime:65	Fault Duty:	28618.3A
Frame:	DS-632 240V 3200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	2400A		
Plug:	2400A		

Setting: 1) LTPU (0.5-1.0 x P)	1	(2400A)	
2) LTD (2-24 Sec.)	24		
3) STPU (2-10 x LTPU)	4	(9600A)	
4) STD (0.1-0.5 Sec.)	0.5 Sec.	I^2 t Out	
5) INST (2-12 x P)	6	(14400A)	



TCC Name: 2A-004
Oneline: 2A-004 - Wilber
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
LOOP 2C FEEDER PHASE OVERCURRENT RELAY (3C & 4C TYPICAL)
2C-50/51 (3C & 4C Typical)

TCC: 006, 2C-001 – 006, 3C-001 – 005, 4C-001 – 007

Device: SEL-751

CT Ratio: 400:5

Existing Settings: None new device

Feeder: 1 per phase 1/0 MCM rated at 200 amps

Pickup (51P1P):
Set not more than 600% of feeder rating
Set not more than 67% of the upstream device
576 x 0.67 = 386
Set not less than 150% of the largest downstream device
125 x 1.5 = 187
Set for 3.1 AT (248A)

Delay (51P1C/51P1D):
Set under transformer damage curve
Set no less than 0.15 seconds above the downstream device
Set no less than 0.3 second below the upstream device
Set for 3.3 TD on the U4 Extremely Inverse Curve

Instantaneous (50P1P):
OFF

Project Name: SUNY-OSWEGO April 2013
TCC Name: 2C-001.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	CBL-084	TCC Name:	2C-001.tcc
Bus Name:	0.3.2	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1200	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	Main C	TCC Name:	2C-001.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	BUS C 50/51	TCC Name:	2C-001.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	351-0, -1, -2, -3, -4	Class Desc:	351-1
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	600A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51PP	4.8 (576A)	Test Points:	@2.0X, 3.335s
2) U3, Very Inv	2.4		@5.0X, 0.619s
			@10.0X, 0.325s

Device Name:	2C-50/51	TCC Name:	2C-001.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

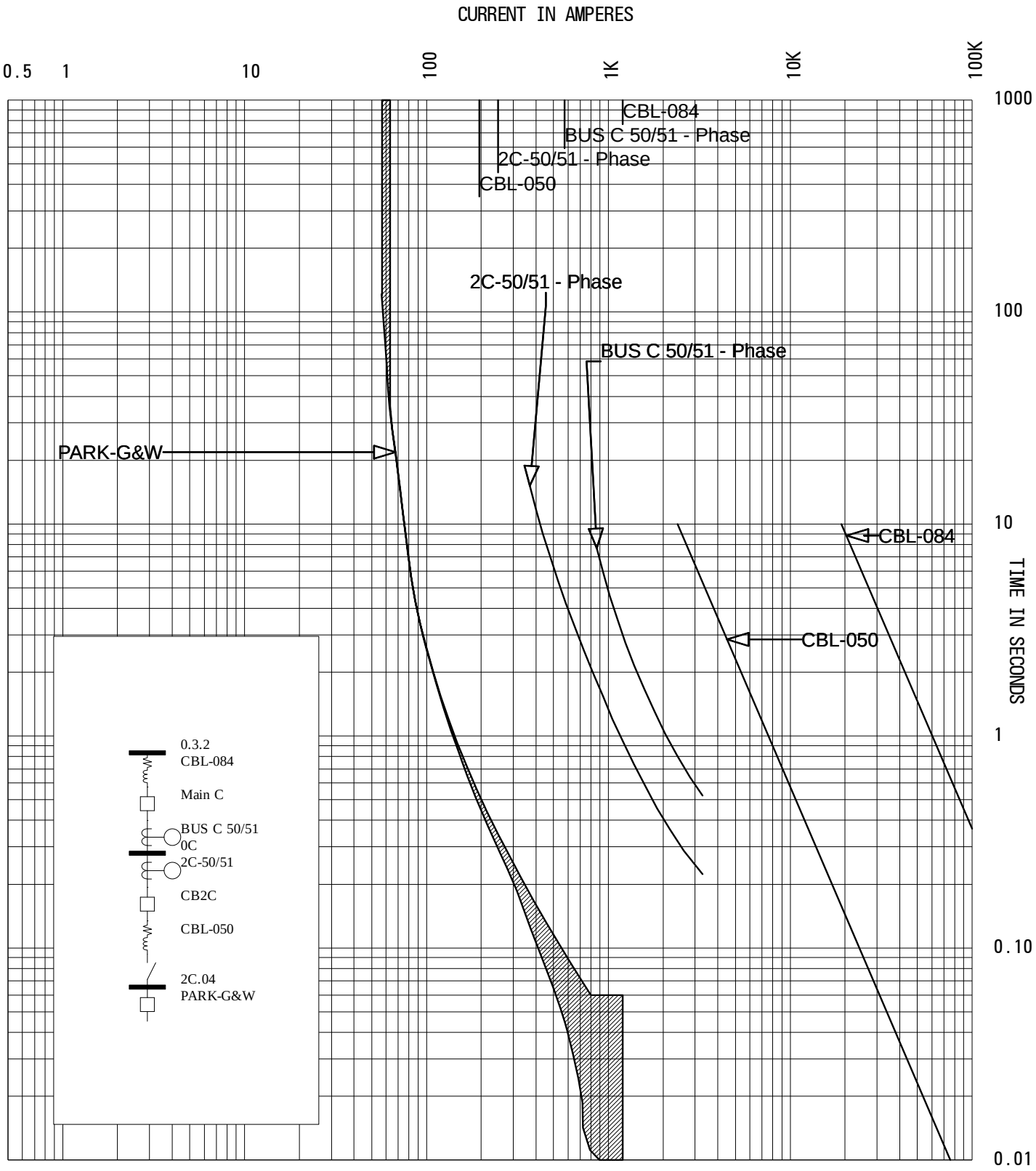
Device Name:	CB2C	TCC Name:	2C-001.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-050	TCC Name:	2C-001.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0416	TCC Name:	2C-001.tcc
Bus Name:	2C.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2891.8A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

Device Name:	PARK-G&W	TCC Name:	2C-001.tcc
Bus Name:	2C.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	G&W		
Description:	15-300A, 500:1 CT		
Type:	Type 2-3, E Speed Standard		
AIC Rating:	16kA	Fault Duty:	2891.8A
Frame:	500:1 15500V 600A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Setting: 1) Minimum Trip 60A (60A)
2) 0.0 Time Delay



TCC Name: 2C-001
Oneline: 2C-001 - Feeder 2C
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Service Building Transformer Primary Overcurrent Device
SERV B-VISTA

TCC: 2C-002

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 112.5 kVA, 13.2 – 208Y/120V, 5.25% Z
4.9 FLA @ 13.2kV, 312.3 FLA @ 208V

Fuse

Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 4.9 x 3 = 14.8
Set not less than secondary main device 400 x (208 / 13200) = 6.3
Set for E Curve 25E (Lowest Setting Available)

Project Name: SUNY-OSWEGO April 2013
TCC Name: 2C-002.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	2C-50/51	TCC Name:	2C-002.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB2C	TCC Name:	2C-002.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-050	TCC Name:	2C-002.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0407	TCC Name:	2C-002.tcc
Bus Name:	2C.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	3074.1A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

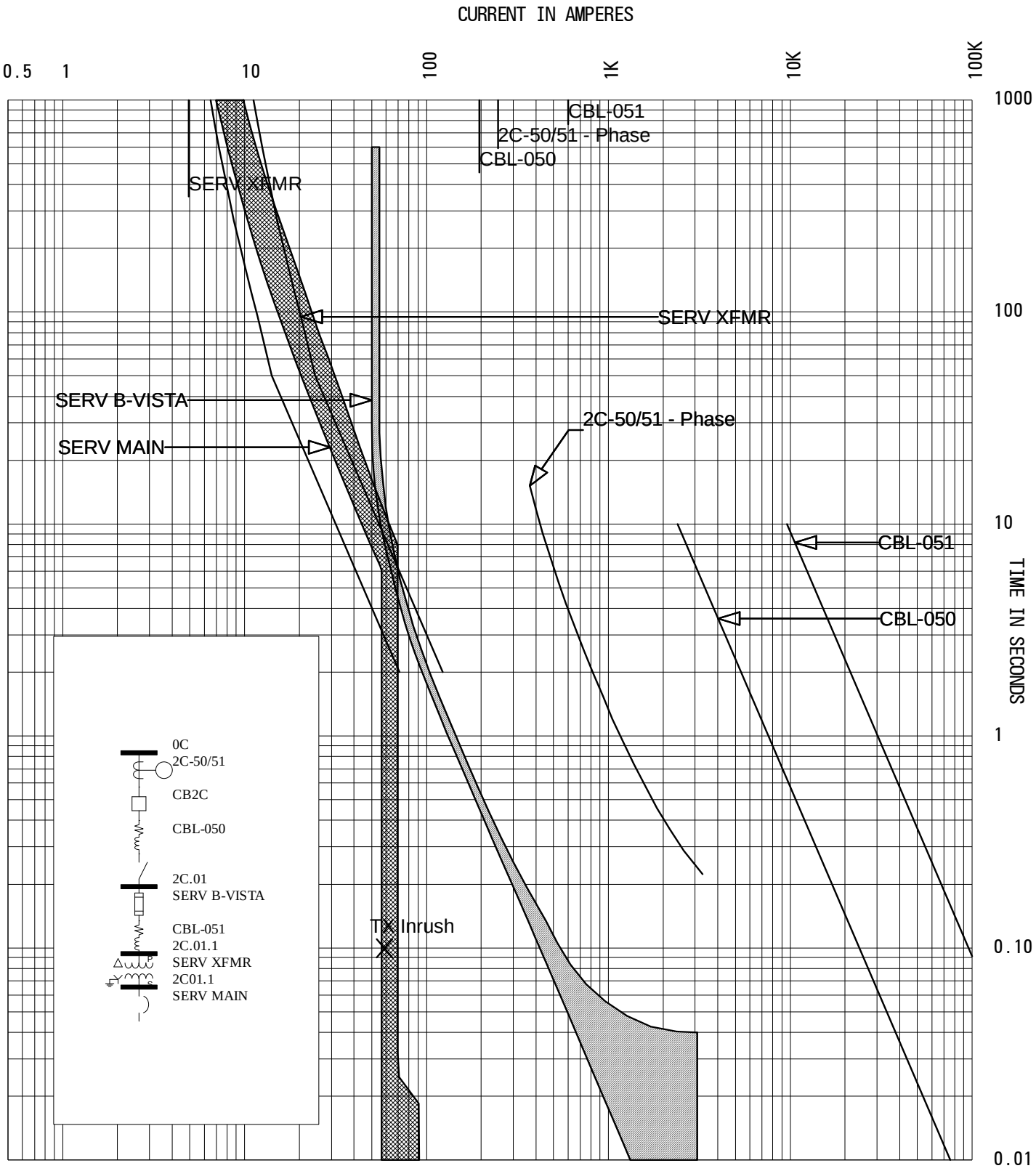
Device Name:	SERV B-VISTA	TCC Name:	2C-002.tcc
Bus Name:	2C.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	3074.1A
Cartridge:	Vista, 25E 15500V 25A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	25A		

Device Name:	CBL-051	TCC Name:	2C-002.tcc
Bus Name:	2C.01	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	SERV XFMR	TCC Name:	2C-002.tcc
Bus Name:	2C.01.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	112.5kVA		
Impedance (%Z):	5.2499	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	SERV MAIN	TCC Name:	2C-002.tcc
Bus Name:	2C01.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	250-400A		
Type:	DK		
AIC Rating:	65kA	Fault Duty:	5772.2A
Frame:	DK 240V 400A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	400A		

Setting: 1) Thermal Curve (Fixed
2) INST (5-10 x Trip) 10 (4000A)



TCC Name: 2C-002
Oneline: 2C-002 - Service Building
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Mackin Hall Transformer Primary Overcurrent Device
MACKIN-VISTA

TCC: 2C-003

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 300 kVA, 13.2 – 208Y/120V, 5.47 % Z
13.1 FLA @ 13.2kV, 832.7 FLA @ 208V

Fuse

Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 13.1 x 3 = 39.4
Set not less than secondary main device 600 x (208 / 13200) = 9.5
Set for E Curve 30E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 2C-003.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	2C-50/51	TCC Name:	2C-003.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB2C	TCC Name:	2C-003.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-050	TCC Name:	2C-003.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0410	TCC Name:	2C-003.tcc
Bus Name:	2C.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	3034.4A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

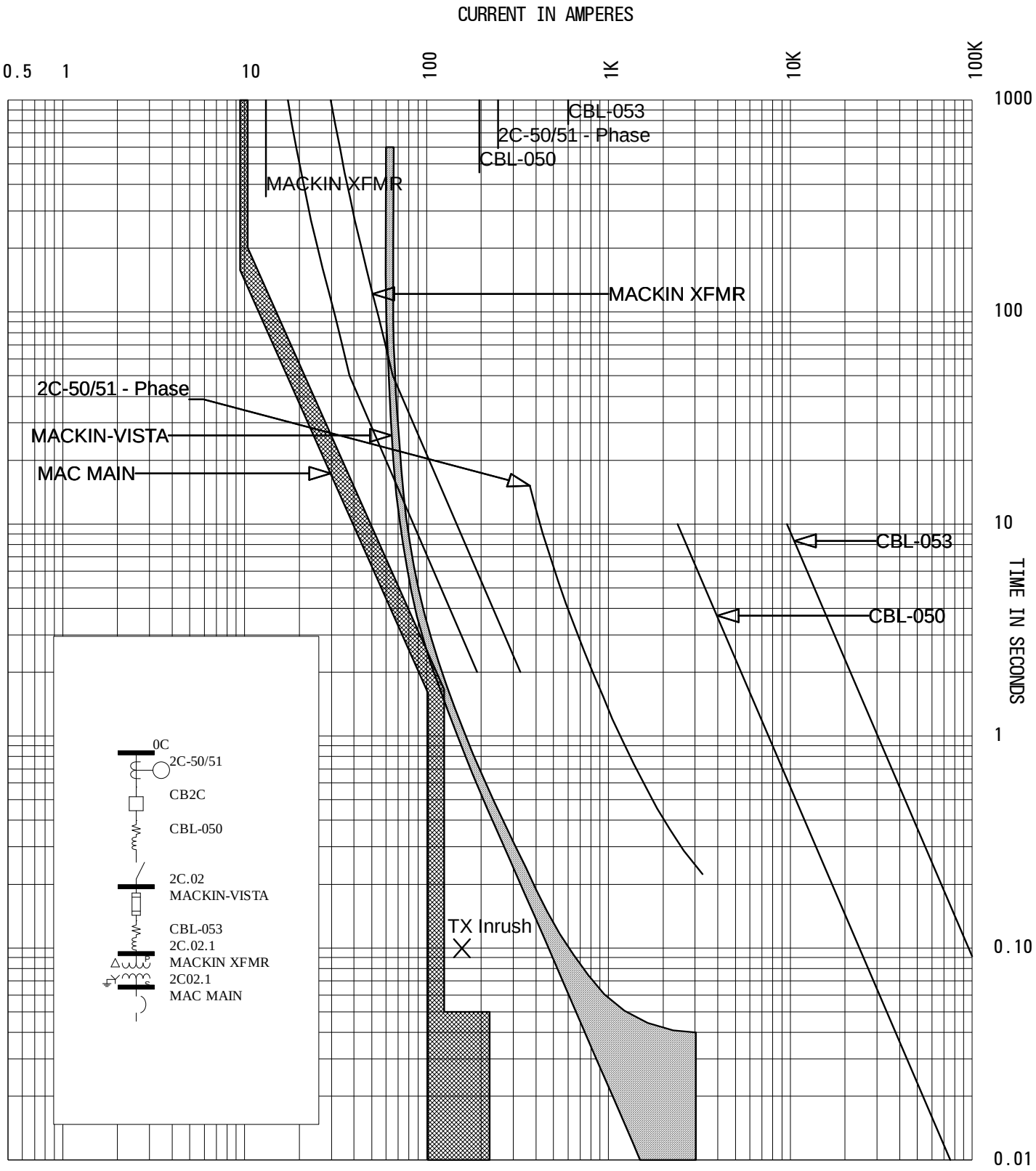
Device Name:	MACKIN-VISTA	TCC Name:	2C-003.tcc
Bus Name:	2C.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	3034.4A
Cartridge:	Vista, 30E 15500V 30A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	30A		

Device Name:	CBL-053	TCC Name:	2C-003.tcc
Bus Name:	2C.02	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	MACKIN XFMR	TCC Name:	2C-003.tcc
Bus Name:	2C.02.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	300.0kVA		
Impedance (%Z):	5.4700	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	MAC MAIN	TCC Name:	2C-003.tcc
Bus Name:	2C02.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	WESTINGHOUSE		
Description:	LSI 100-4K		
Type:	DS DIGITRP		
AIC Rating:	65kA	Fault Duty:	14108.2A
Frame:	DS-420 240V 2000A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1200A		
Plug:			

Setting:			
1) LTPU	0.5	(600A)
2) LTD	2.0	
3) STPU	6.0	(7200A)
4) STD-I2T	0.5	I^2 t In
5) INST	6.0	(7200A)



TCC Name: 2C-003
Oneline: 2C-003 - Mackin
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Rich Hall #1 Transformer Primary Overcurrent Device
RICH-VISTA-1

TCC: 2C-004

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 300 kVA, 13.2 – 208Y/120V, 5.47 % Z
13.1 FLA @ 13.2kV, 832.7 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 13.1 x 3 = 39.4
Set not less than secondary main device 1200 x (208 / 13200) = 18.9
Set for E Curve 30E

Note:
Recommend the secondary main breaker short time pick up (STPU) be set from 8X to 4X.

Project Name: SUNY-OSWEGO April 2013
TCC Name: 2C-004.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	2C-50/51	TCC Name:	2C-004.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB2C	TCC Name:	2C-004.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-050	TCC Name:	2C-004.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0413	TCC Name:	2C-004.tcc
Bus Name:	2C.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2984.9A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

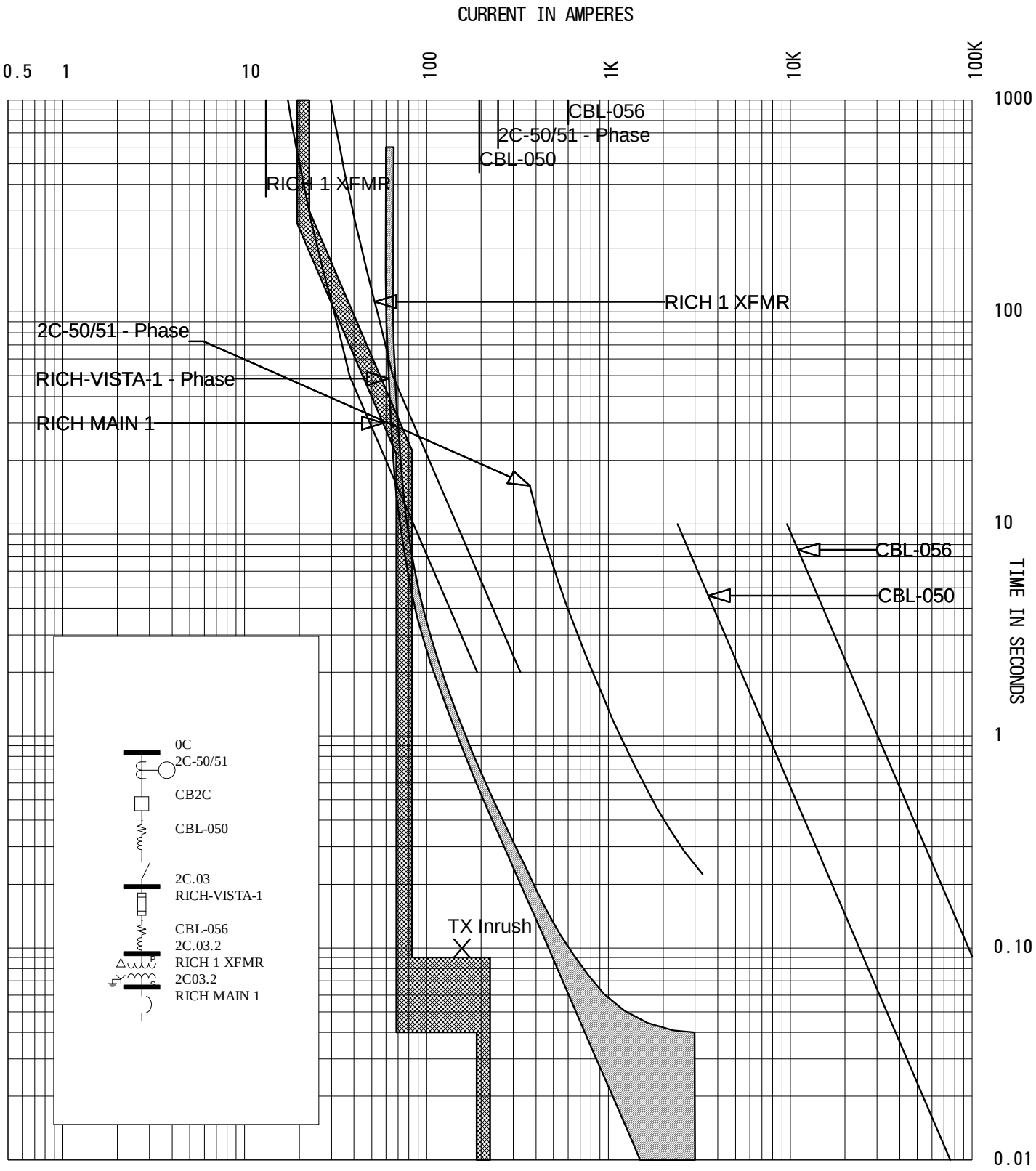
Device Name:	RICH-VISTA-1	TCC Name:	2C-004.tcc
Bus Name:	2C.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2984.9A
Cartridge:	Vista, 30E 15500V 30A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	30A		

Device Name:	CBL-056	TCC Name:	2C-004.tcc
Bus Name:	2C.03	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	RICH 1 XFMR	TCC Name:	2C-004.tcc
Bus Name:	2C.03.2	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	300.0kVA		
Impedance (%Z):	5.4400	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	RICH MAIN 1	TCC Name:	2C-004.tcc
Bus Name:	2C03.2	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LS, 400-1200A Fixed Plug		
Type:	CHND, RMS 310		
AIC Rating:	65kA	Fault Duty:	14163.9A
Frame:	CHND 480V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1200A		
Plug:	1200A		

Setting: 1) LTPU (1.0 x P)	Fixed	(1200A)	
2) LTD (Fixed)	Fixed		
3) STPU (2-8 x P)	4	(4800A)	
4) STD (Fixed)	Fixed	I^2 t Out	
5) INST (14000A)	Fixed	(14000A)	



TCC Name: 2C-004
Oneline: 2C-004-Rich 1
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Rich Hall #2 Transformer Primary Overcurrent Device
RICH-VISTA-2

TCC: 2C-005

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 500 kVA, 13.2 – 480Y/277V, 5.52 % Z
21.9FLA @ 13.2kV, 601 FLA @ 480V

Fuse

Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 21.9 x 3 = 65.6
Set not less than secondary main device 1600 x (480 / 13200) = 58.2
Set for E Curve 50E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 2C-005.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	2C-50/51	TCC Name:	2C-005.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB2C	TCC Name:	2C-005.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-050	TCC Name:	2C-005.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0413	TCC Name:	2C-005.tcc
Bus Name:	2C.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2984.9A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

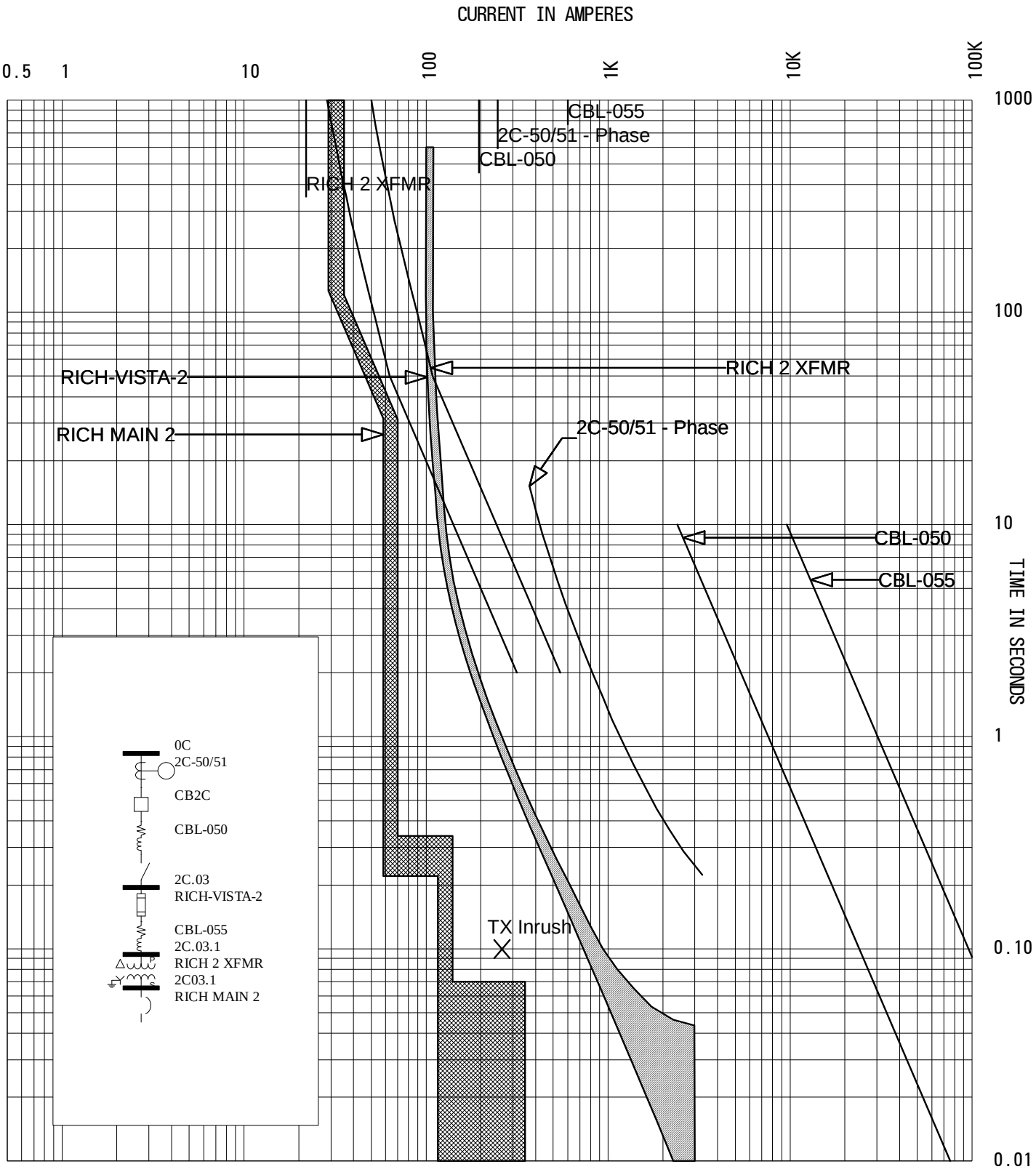
Device Name:	RICH-VISTA-2	TCC Name:	2C-005.tcc
Bus Name:	2C.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2984.9A
Cartridge:	Vista, 50E 15500V 50A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	50A		

Device Name:	CBL-055	TCC Name:	2C-005.tcc
Bus Name:	2C.03	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	RICH 2 XFMR	TCC Name:	2C-005.tcc
Bus Name:	2C.03.1	Bus Voltage:	13200.0V / 480V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/480 LL
Nominal Size:	500.0kVA		
Impedance (%Z):	5.5200	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	RICH MAIN 2	TCC Name:	2C-005.tcc
Bus Name:	2C03.1	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	SIEMENS		
Description:	LSI, 150-5000A		
Type:	RL, Static Trip III		
AIC Rating:	65kA ShortTime:50	Fault Duty:	9621.0A
Frame:	RL-1600 480V 1600A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1600A		
Plug:			

Setting: 1) LTPU (0.5-1.0 x S)	0.5	(800A)	
2) LTD (3.5-30 Sec.)	3.5		
3) STPU (2-12 x LTPU)	2	(1600A)	
4) STD (0.08-0.4 Sec.)	0.22	I^2 t Out	
5) INST (2-15 x S)	2	(3200A)	



TCC Name: 2C-005
Oneline: 2C-005 - Rich 2
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Park Hall Transformer Primary Overcurrent Device
PARK-G&W

TCC: 2C-001, 006

Existing Device: G&W SF6 Switch

Existing Setting: None – New Device

Transformer: 750 kVA, 13.2 – 208Y/120V, 5.93 % Z
32.8 FLA @ 13.2kV, 2082 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 32.8 x 3 = 98.4
Set not less than secondary main device 1200 x (208 / 13200) = 18.9
Set for E Curve 60E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 2C-006.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	2C-50/51	TCC Name:	2C-006.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB2C	TCC Name:	2C-006.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-050	TCC Name:	2C-006.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name: PD-0416 TCC Name: 2C-006.tcc
Bus Name: 2C.04 Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer:
Description:
Type:
AIC Rating: 0kA Fault Duty: 2891.8A
Frame: Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
FLA: 0.00A
Setting:

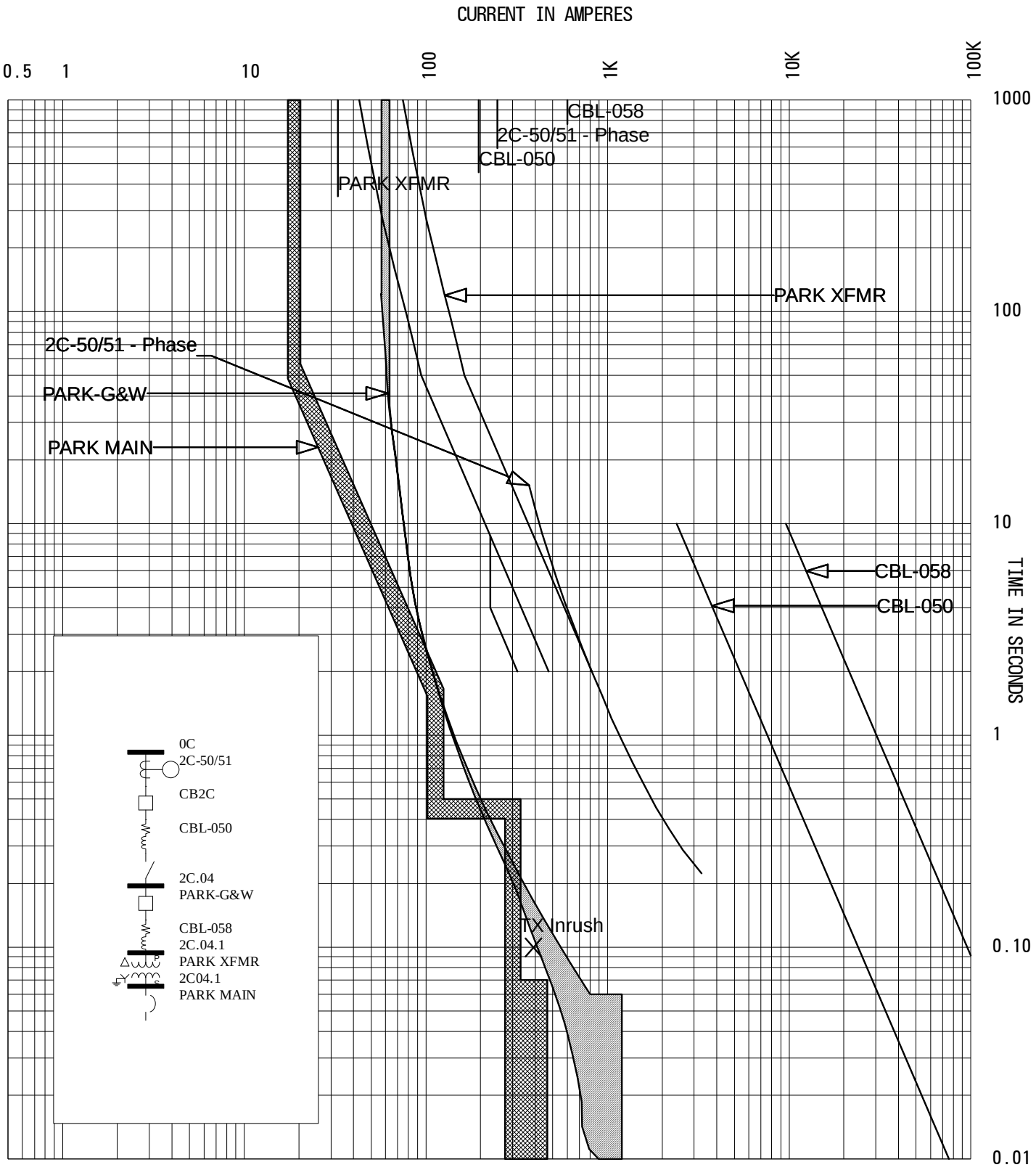
Device Name: PARK-G&W TCC Name: 2C-006.tcc
Bus Name: 2C.04 Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: G&W
Description: 15-300A, 500:1 CT
Type: Type 2-3, E Speed Standard
AIC Rating: 16kA Fault Duty: 2891.8A
Frame: 500:1 15500V 600A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Sensor:
Plug:
Setting: 1) Minimum Trip 60A (60A)
2) 0.0 Time Delay

Device Name: CBL-058 TCC Name: 2C-006.tcc
Bus Name: 2C.04 Bus Voltage: 13200.0V
Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Description: Cable Damage Curve Qty/Ph: 1
Size: 600 Cont. Temp: 65 deg C.
Material: Copper Damage Temp: 130 deg C.

Device Name: PARK XFMR TCC Name: 2C-006.tcc
Bus Name: 2C.04.1 Bus Voltage: 13200.0V / 208V
Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Description: 2-Winding Transformer Damage Curve Rated Volts: 13200 LL/208 LL
Nominal Size: 750.0kVA
Impedance (%Z): 5.9300 Pri Connection: Delta
Inrush Factor: 12.0x Sec Connection: Wye-Ground

Device Name:	PARK MAIN	TCC Name:	2C-006.tcc
Bus Name:	2C04.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	85kA ShortTime:65	Fault Duty:	29504.2A
Frame:	DS-632 240V 3200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	2400A		
Plug:	2400A		

Setting:			
1) LTPU (0.5-1.0 x P)	0.5	(1200A)	
2) LTD (2-24 Sec.)	2		
3) STPU (2-10 x LTPU)	6	(7200A)	
4) STD (0.1-0.5 Sec.)	0.5 Sec.	I^2 t Out	
5) INST (2-12 x P)	M1(8)	(19200A)	



TCC Name: 2C-006
Oneline: 2C-006 - Park
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Convocation Center Transformer Primary Overcurrent Device
CONVO-VISTA

TCC: 3B-002

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 1000/1333 kVA, 13.2 – 208Y/120V, 5.32 % Z
58.3 FLA @ 13.2kV, 1603 FLA @ 480V

Fuse
Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 58.3 x 3 = 174.9
Set not less than secondary main device 1600 x (208 / 13200) = 25.2
Set for E Curve 80E

Note:
Secondary main breaker does not appear to be set up. Recommend temporary settings: LTPU 1X; LTD 1; STPU 4X; STD Min I2T Out; Inst 10X; GFPU 1200A; GFD 0.5 Sec. These settings are temporary only. A complete study should be performed.

Project Name: SUNY-OSWEGO April 2013
TCC Name: 3B-002.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	3B-50/51	TCC Name:	3B-002.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB3B	TCC Name:	3B-002.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-007	TCC Name:	3B-002.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0428	TCC Name:	3B-002.tcc
Bus Name:	3B.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2293.8A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

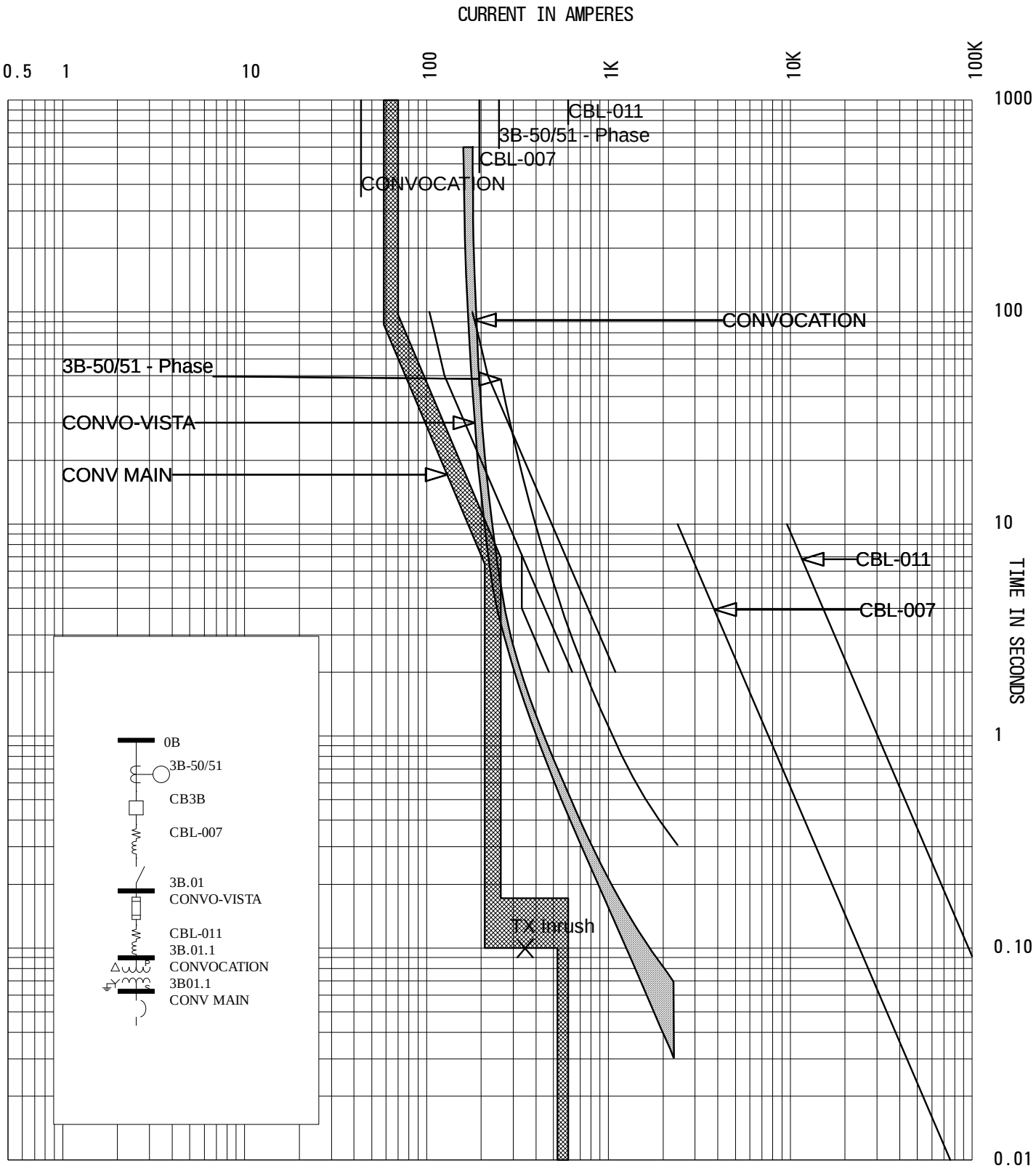
Device Name:	CONVO-VISTA	TCC Name:	3B-002.tcc
Bus Name:	3B.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2293.8A
Cartridge:	Vista, 80E 15500V 80A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	80A		

Device Name:	CBL-011	TCC Name:	3B-002.tcc
Bus Name:	3B.01	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	CONVOCATION	TCC Name:	3B-002.tcc
Bus Name:	3B.01.1	Bus Voltage:	13200.0V / 480V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/480 LL
Nominal Size:	1000.0kVA		
Impedance (%Z):	5.3500	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	CONV MAIN	TCC Name:	3B-002.tcc
Bus Name:	3B01.1	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	GE		
Description:	LSI, 200-2000A Sensors		
Type:	SS, SH PowerBreak II, MVT Plus/PM		
AIC Rating:	65kA ShortTime:40	Fault Duty:	16576.2A
Frame:	SS 480V 1600A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1600A		
Plug:	1600A		

Setting: 1) LTPU (0.5-1.0 x P)	1	(1600A)	
2) LTD (1-4)	1		
3) STPU (1.5-9 x LTPU)	4	(6400A)	
4) STD (Min-Max)	Min	I^2 t Out	
5) INST (1.5-15 x P)	10	(16000A)	



TCC Name: 3B-002
Oneline: 3B - 002 - Convocation Center
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Penfield Library Transformer Primary Overcurrent Device
PEN VISTA

TCC:	3B-001, 003
Existing Device:	S&C Vista Switch
Existing Setting:	Tap Setting Phase: 150A, GF: 50A Unknown
Transformer:	2000/2667 kVA, 13.2 – 480Y/277V, (No Impedance Listed) 116.7 FLA @ 13.2kV, 3208FLA @ 480V

Fuse
Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 116.7 x 3 = 350
Set not less than secondary main device 3200 x (480 / 13200) = 116.4
Set for E Curve 125E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 3B-003.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	3B-50/51	TCC Name:	3B-003.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB3B	TCC Name:	3B-003.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-007	TCC Name:	3B-003.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0363	TCC Name:	3B-003.tcc
Bus Name:	3B.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2276.7A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

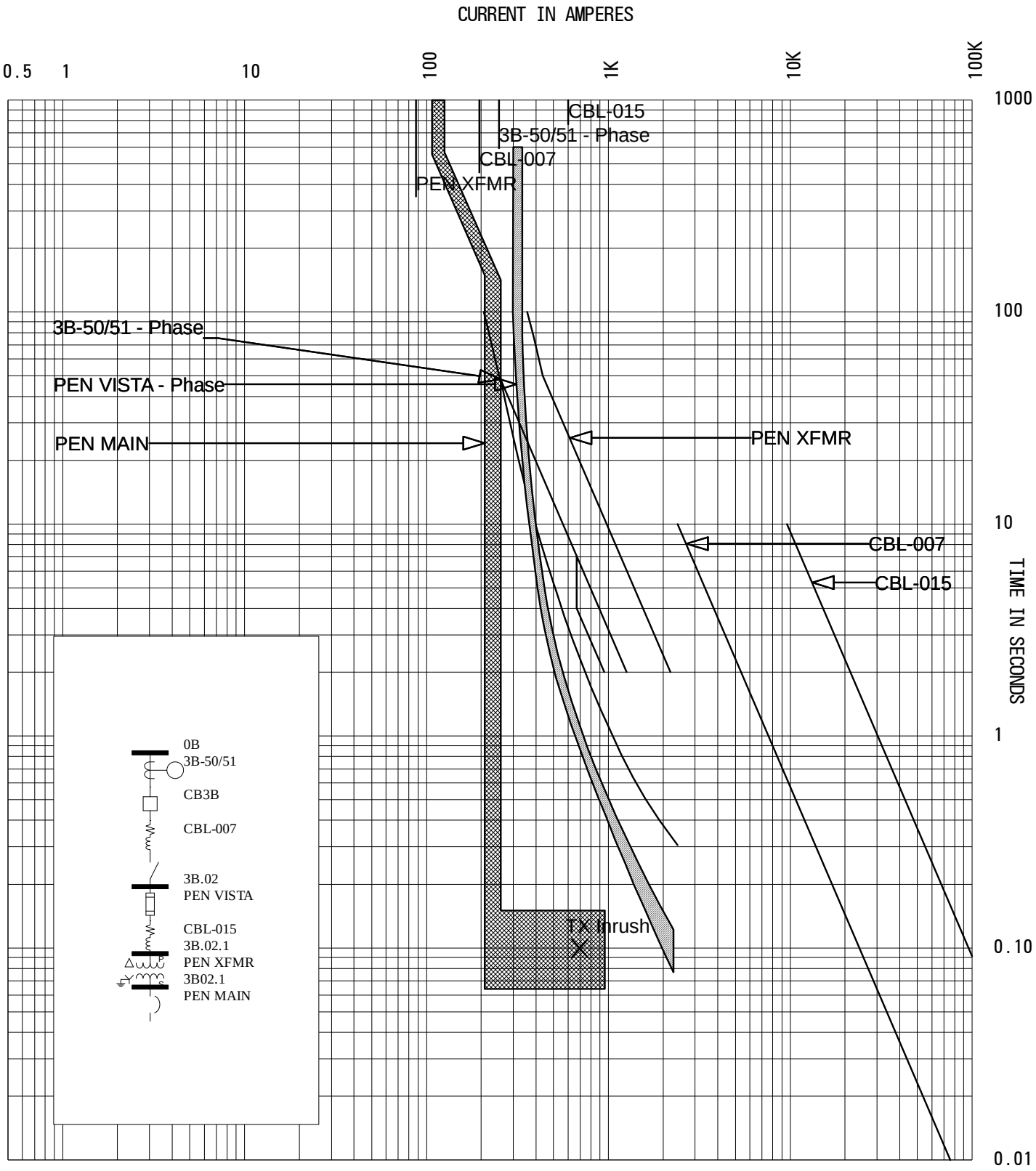
Device Name:	PEN VISTA	TCC Name:	3B-003.tcc
Bus Name:	3B.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2276.7A
Cartridge:	Vista, 125E 15500V 125A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	125A		

Device Name:	CBL-015	TCC Name:	3B-003.tcc
Bus Name:	3B.02	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	PEN XFMR	TCC Name:	3B-003.tcc
Bus Name:	3B.02.1	Bus Voltage:	13200.0V / 480V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/480 LL
Nominal Size:	2000.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	PEN MAIN	TCC Name:	3B-003.tcc
Bus Name:	3B02.1	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	65kA ShortTime:65	Fault Duty:	26280.3A
Frame:	DS-632 480V 3200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	3200A		
Plug:	3200A		

Setting: 1) LTPU (0.5-1.0 x P)	1	(3200A)	
2) LTD (2-24 Sec.)	20		
3) STPU (2-10 x LTPU)	2	(6400A)	
4) STD (0.1-0.5 Sec.)	0.1 Sec.	I^2 t Out	



TCC Name: 3B-003
Oneline: 3B - 003 - Penfield
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Lanigan Transformer Primary Overcurrent Device
LAN-VISTA

TCC: 3B-004

Existing Device: S&C Vista Switch

Existing Setting: Tap Setting Phase: 150A, GF: 50A

Transformer: 1000 kVA, 13.2 – 208Y/120V (no impedance listed)
43.7 FLA @ 13.2kV, 2776 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 43.7 x 3 = 131.2
Set not less than secondary main device 2000 x (208 / 13200) = 31.5
Set for E Curve 80E

Note:
Secondary main limits transformer output to 72% of its total capacity.

Project Name: SUNY-OSWEGO April 2013
TCC Name: 3B-004.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	3B-50/51	TCC Name:	3B-004.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB3B	TCC Name:	3B-004.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-007	TCC Name:	3B-004.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0376	TCC Name:	3B-004.tcc
Bus Name:	3B.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2259.5A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

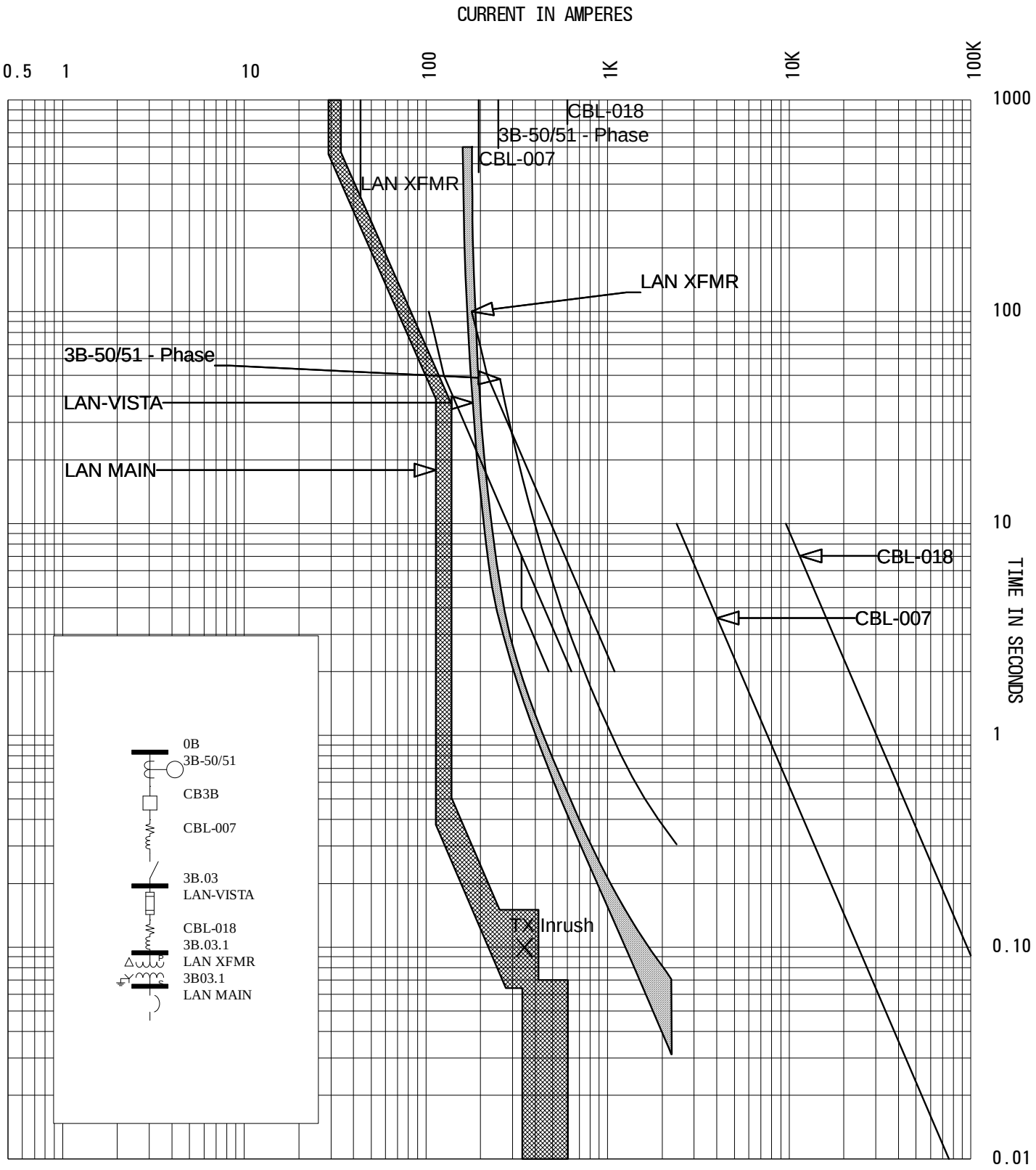
Device Name:	LAN-VISTA	TCC Name:	3B-004.tcc
Bus Name:	3B.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2259.5A
Cartridge:	Vista, 80E 15500V 80A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	80A		

Device Name:	CBL-018	TCC Name:	3B-004.tcc
Bus Name:	3B.03	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	LAN XFMR	TCC Name:	3B-004.tcc
Bus Name:	3B.03.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	1000.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	LAN MAIN	TCC Name:	3B-004.tcc
Bus Name:	3B03.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	65kA ShortTime:65	Fault Duty:	38268.0A
Frame:	DS-420 480V 2000A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	2000A		
Plug:	2000A		

Setting:			
1) LTPU (0.5-1.0 x P)	1	(2000A)	
2) LTD (2-24 Sec.)	20		
3) STPU (2-10 x LTPU)	4	(8000A)	
4) STD (0.1-0.5 Sec.)	0.1 Sec.	I^2 t In	
5) INST (2-12 x P)	M2(12)	(24000A)	



TCC Name: 3B-004
Oneline: 3B - 004 - Lanigan
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Mahar Hall Transformer Primary Overcurrent Device
MAHAR-VISTA

TCC: 3B-005

Existing Device: S&C Vista Switch

Existing Setting: Tap Setting Phase: 150A, GF: 50A

Transformer: 750 kVA, 13.2 – 208Y/120V, (no impedance noted)
32.8 FLA @ 13.2kV, 2081.8 FLA @ 208V

Fuse

Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 32.8 x 3 = 98.4
Set not less than secondary main device 2000 x (208 / 13200) = 31.5
Set for E Curve 65E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 3B-005.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	3B-50/51	TCC Name:	3B-005.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB3B	TCC Name:	3B-005.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-007	TCC Name:	3B-005.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0357	TCC Name:	3B-005.tcc
Bus Name:	3B.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2208.6A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

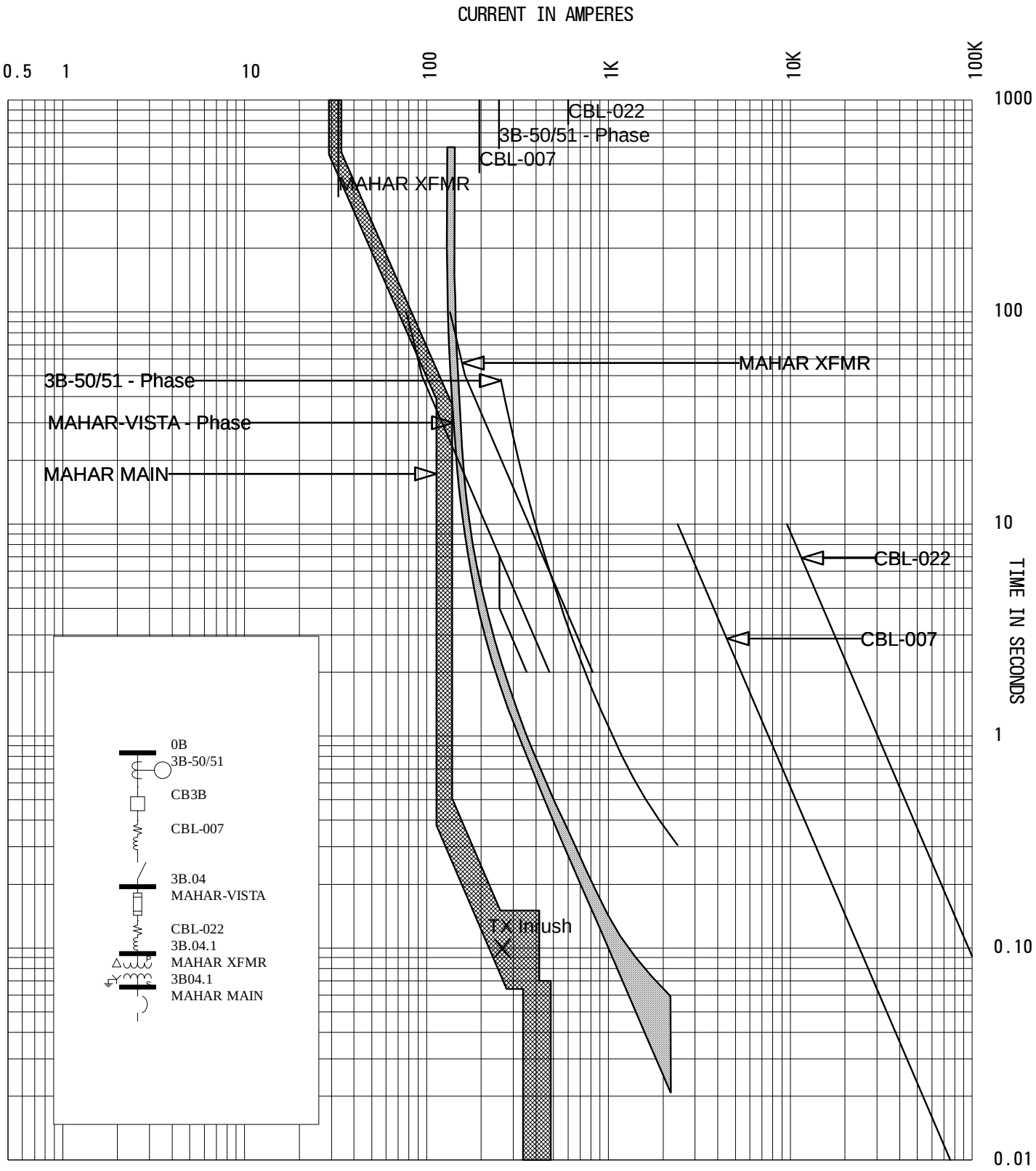
Device Name:	MAHAR-VISTA	TCC Name:	3B-005.tcc
Bus Name:	3B.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2208.6A
Cartridge:	Vista, 65E 15500V 65A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	65A		

Device Name:	CBL-022	TCC Name:	3B-005.tcc
Bus Name:	3B.04	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	MAHAR XFMR	TCC Name:	3B-005.tcc
Bus Name:	3B.04.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	750.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	MAHAR MAIN	TCC Name:	3B-005.tcc
Bus Name:	3B04.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	65kA ShortTime:65	Fault Duty:	30599.6A
Frame:	DS-4200 240V 2000A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	2000A		
Plug:	2000A		

Setting:				
	1) LTPU (0.5-1.0 x P)	1	(2000A)
	2) LTD (2-24 Sec.)	20	
	3) STPU (2-10 x LTPU)	4	(8000A)
	4) STD (0.1-0.5 Sec.)	0.1 Sec.	I^2 t In
	5) INST (2-12 x P)	M2(12)	(24000A)



TCC Name: 3B-005
Oneline: 3B - 005 - Mahar
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

Project Name: SUNY-OSWEGO April 2013
TCC Name: 3B-001.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	CBL-003	TCC Name:	3B-001.tcc
Bus Name:	0.1.2	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1200	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	Main B	TCC Name:	3B-001.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	BUS B 50/51	TCC Name:	3B-001.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	1200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	0.43 (516A)	Test Points:	@2.0X, 3.838s
2) Ext Inverse	2.2 1		@5.0X, 0.544s
			@10.0X, 0.216s

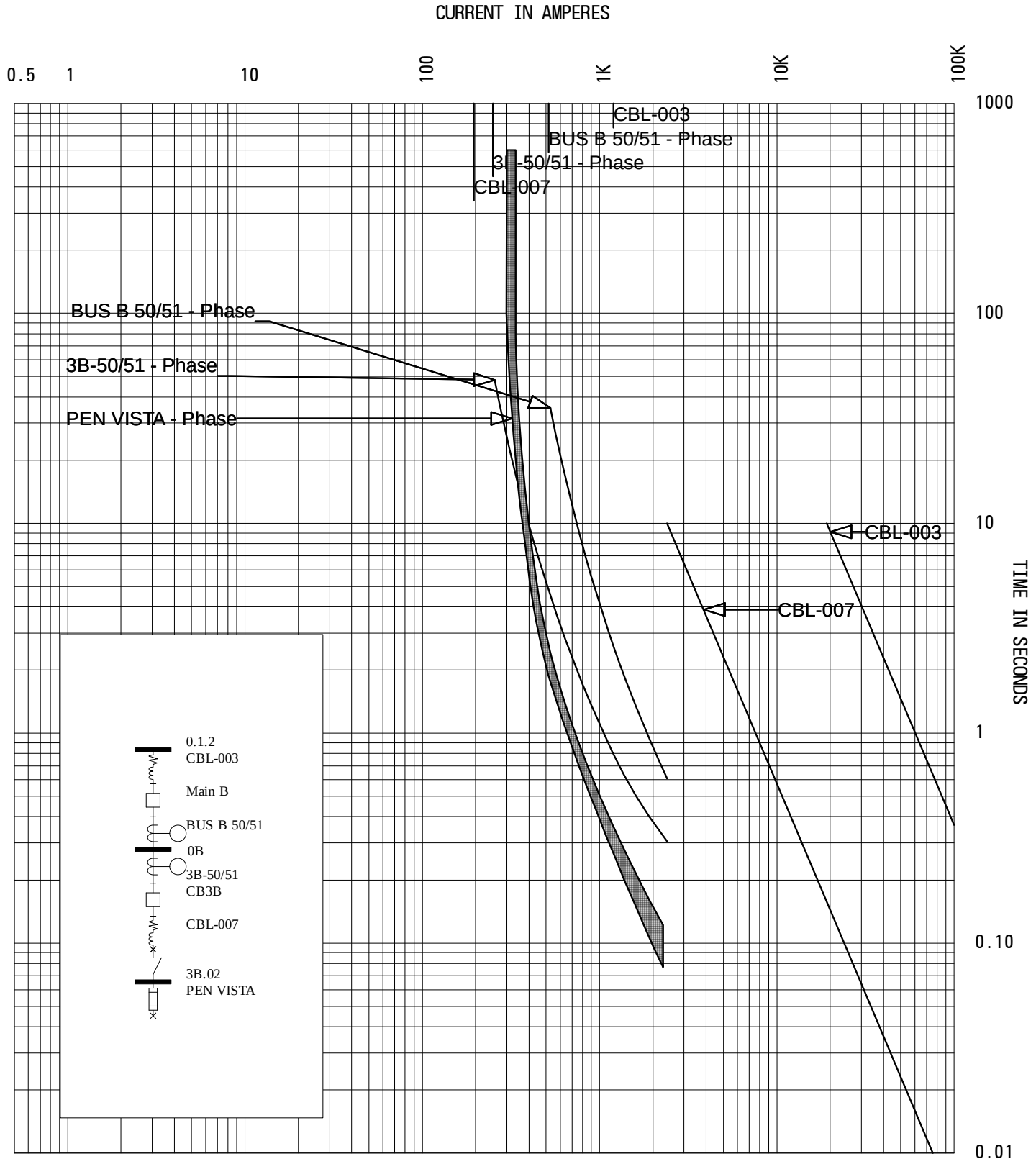
Device Name:	3B-50/51	TCC Name:	3B-001.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB3B	TCC Name:	3B-001.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-007	TCC Name:	3B-001.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0363	TCC Name:	3B-001.tcc
Bus Name:	3B.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2276.7A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

Device Name:	PEN VISTA	TCC Name:	3B-001.tcc
Bus Name:	3B.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2276.7A
Cartridge:	Vista, 125E 15500V 125A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	125A		



TCC Name: 3B-001
Oneline: 3B-001 - Feeder B3
April 26, 2013 2:35 PM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

Project Name: SUNY-OSWEGO April 2013
TCC Name: 3C-001.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	CBL-084	TCC Name:	3C-001.tcc
Bus Name:	0.3.2	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1200	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	Main C	TCC Name:	3C-001.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	BUS C 50/51	TCC Name:	3C-001.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	351-0, -1, -2, -3, -4	Class Desc:	351-1
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	600A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51PP	4.8 (576A)	Test Points:	@2.0X, 3.335s
2) U3, Very Inv	2.4		@5.0X, 0.619s
			@10.0X, 0.325s

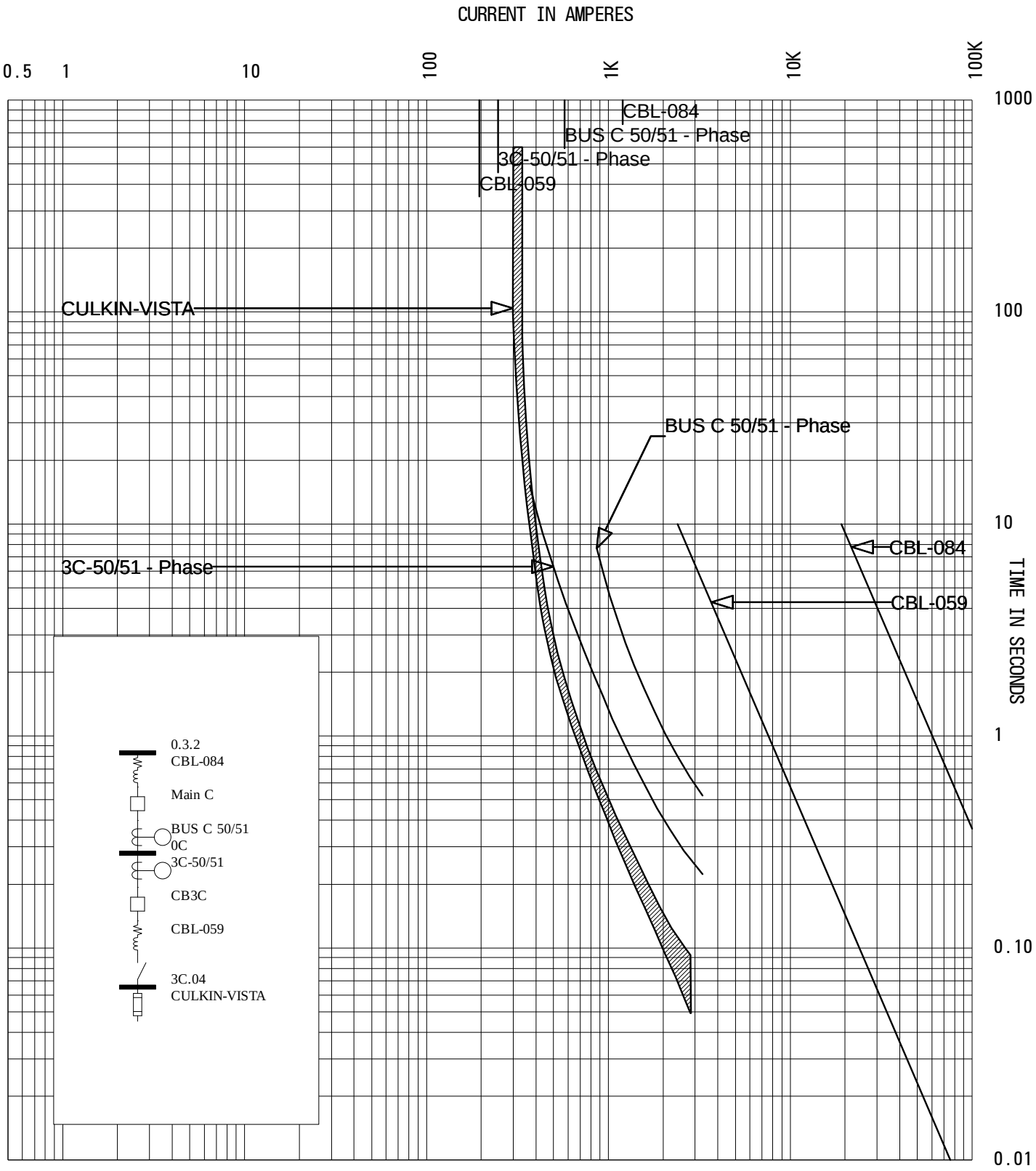
Device Name:	3C-50/51	TCC Name:	3C-001.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB3C	TCC Name:	3C-001.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-059	TCC Name:	3C-001.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0418	TCC Name:	3C-001.tcc
Bus Name:	3C.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2850.1A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

Device Name:	CULKIN-VISTA	TCC Name:	3C-001.tcc
Bus Name:	3C.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2850.1A
Cartridge:	Vista, 125E 15500V 125A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	125A		



TCC Name: 3C-001
Oneline: 3C-001 - Feeder 3C
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Funnelle Hall Transformer Primary Overcurrent Device
FUNNELLE-VISTA

TCC: 3C-002

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 300 kVA, 13.2 – 208Y/120V, 5.52% Z
13.1 FLA @ 13.2kV, 832.7 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 13.1 x 3 = 39.4
Set not less than secondary main device 1200 x (208 / 13200) = 18.9
Set for E Curve 30E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 3C-002.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	3C-50/51	TCC Name:	3C-002.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB3C	TCC Name:	3C-002.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-059	TCC Name:	3C-002.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

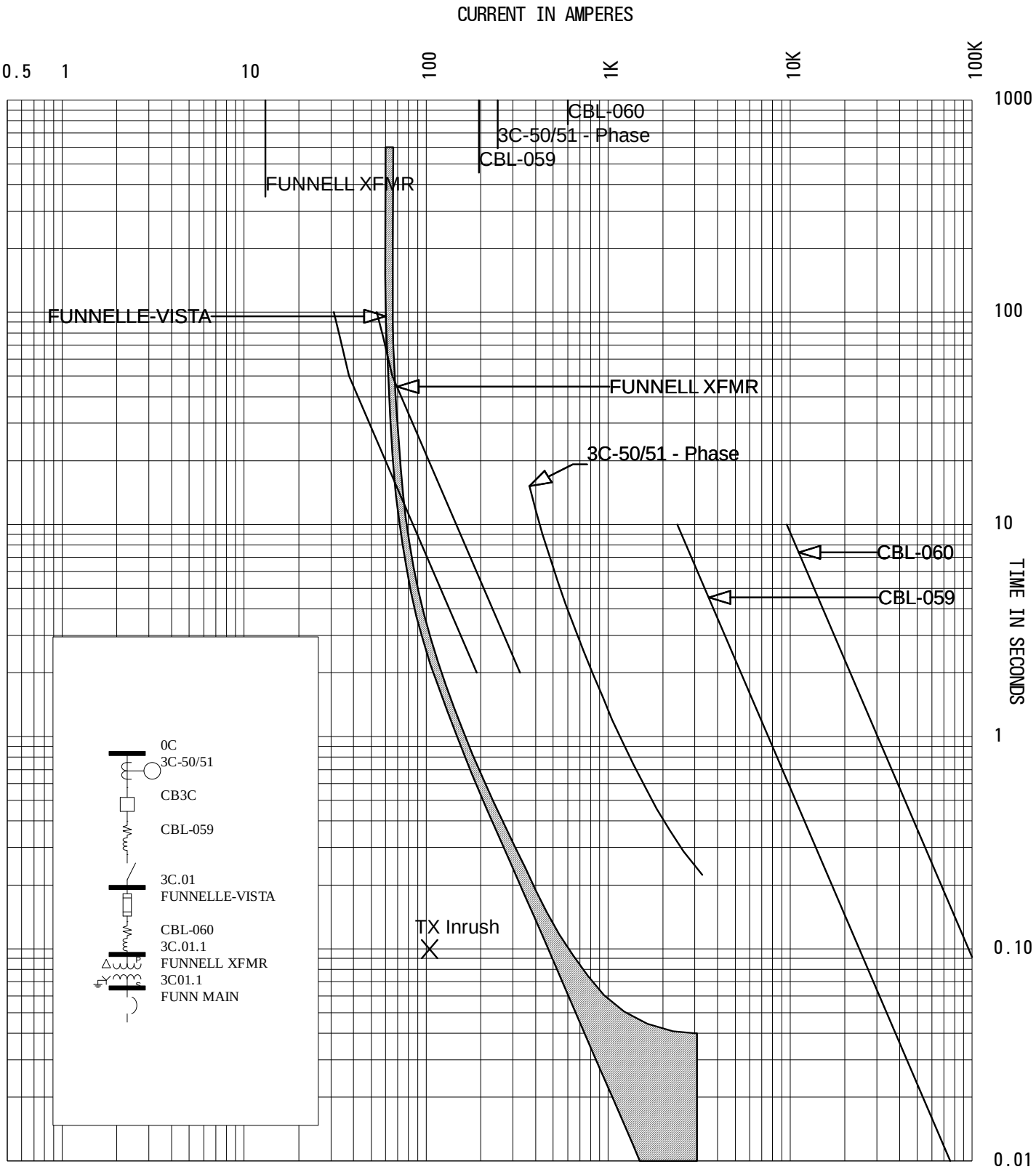
Device Name:	PD-0361	TCC Name:	3C-002.tcc
Bus Name:	3C.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	3069.1A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

Device Name:	FUNNELLE-VISTA	TCC Name:	3C-002.tcc
Bus Name:	3C.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	3069.1A
Cartridge:	Vista, 30E 15500V 30A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	30A		

Device Name:	CBL-060	TCC Name:	3C-002.tcc
Bus Name:	3C.01	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	FUNNELL XFMR	TCC Name:	3C-002.tcc
Bus Name:	3C.01.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	300.0kVA		
Impedance (%Z):	5.5200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	FUNN MAIN	TCC Name:	3C-002.tcc
Bus Name:	3C01.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	14001.0A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			
Setting:			



TCC Name: 3C-002
Oneline: 3C-002 - Funnelle
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Cooper Dining Hall Transformer Primary Overcurrent Device
COOPER-VISTA

TCC: 3C-003

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 500 kVA, 13.2 – 208Y/120V, 5.45 % Z
21.9 FLA @ 13.2kV, 1388 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 21.9 x 3 = 65.6
Set not less than secondary main device 1600 x (208 / 13200) = 25.2
Set for E Curve 50E

Note:
Secondary main does not appear to be set up correctly. Existing settings are 2000A frame; 2000A plug; LTPU 0.5; LTD 2; STPU 6; STD 0.5; Inst M1(8X). Recommend further study. Recommended temporary settings are LTPU 0.8; LTD 2; STPU 5; STD 0.5; Inst M1(8X).

Project Name: SUNY-OSWEGO April 2013
TCC Name: 3C-003.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	3C-50/51	TCC Name:	3C-003.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB3C	TCC Name:	3C-003.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-059	TCC Name:	3C-003.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0370	TCC Name:	3C-003.tcc
Bus Name:	3C.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2975.1A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

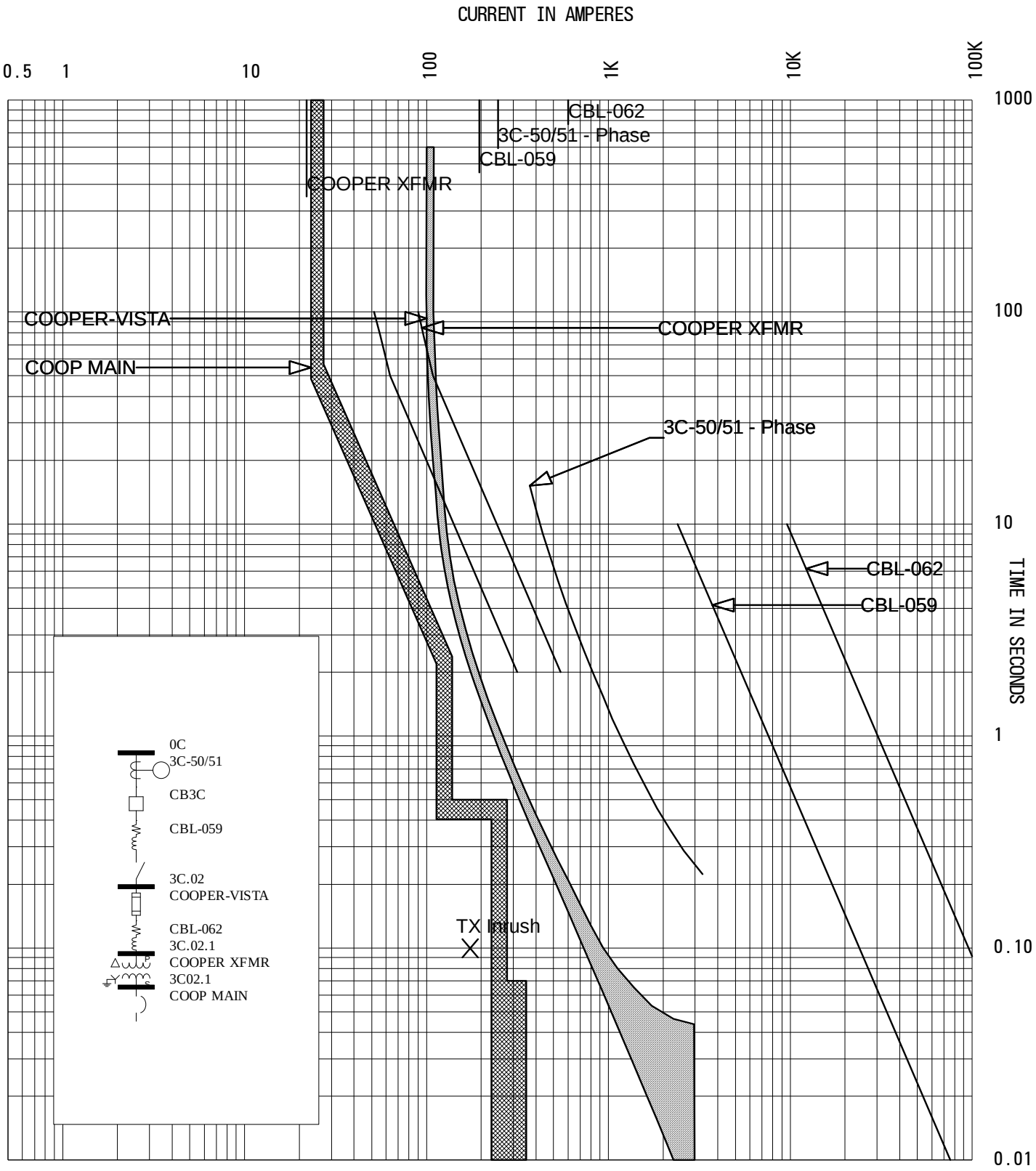
Device Name:	COOPER-VISTA	TCC Name:	3C-003.tcc
Bus Name:	3C.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2975.1A
Cartridge:	Vista, 50E 15500V 50A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	50A		

Device Name:	CBL-062	TCC Name:	3C-003.tcc
Bus Name:	3C.02	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	COOPER XFMR	TCC Name:	3C-003.tcc
Bus Name:	3C.02.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	500.0kVA		
Impedance (%Z):	5.4500	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	COOP MAIN	TCC Name:	3C-003.tcc
Bus Name:	3C02.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	65kA ShortTime:65	Fault Duty:	22445.8A
Frame:	DS-4200 240V 2000A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	2000A		
Plug:	2000A		

Setting:			
1) LTPU (0.5-1.0 x P)	0.8	(1600A)	
2) LTD (2-24 Sec.)	2		
3) STPU (2-10 x LTPU)	5	(8000A)	
4) STD (0.1-0.5 Sec.)	0.5 Sec.	I^2 t Out	
5) INST (2-12 x P)	M1(8)	(16000A)	



TCC Name: 3C-003
Oneline: 3C-003 - Cooper
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Hart Hall Transformer Primary Overcurrent Device
HART-VISTA

TCC: 3C-004

Existing Device: S&C Vista Switch

Existing Setting: Unknown

Transformer: 300 kVA, 13.2 – 208Y/120V, 5.45% Z
13.1 FLA @ 13.2kV, 832.7 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 13.1 x 3 = 39.4
Set not less than secondary main device 1200 x (208 / 13200) = 18.9
Set for E Curve 30E

Note:
Recommend secondary main breaker short time pick up (STPU) be limited from 8X to 4X.

Project Name: SUNY-OSWEGO April 2013
TCC Name: 3C-004.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	3C-50/51	TCC Name:	3C-004.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB3C	TCC Name:	3C-004.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-059	TCC Name:	3C-004.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0394	TCC Name:	3C-004.tcc
Bus Name:	3C.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2950.5A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

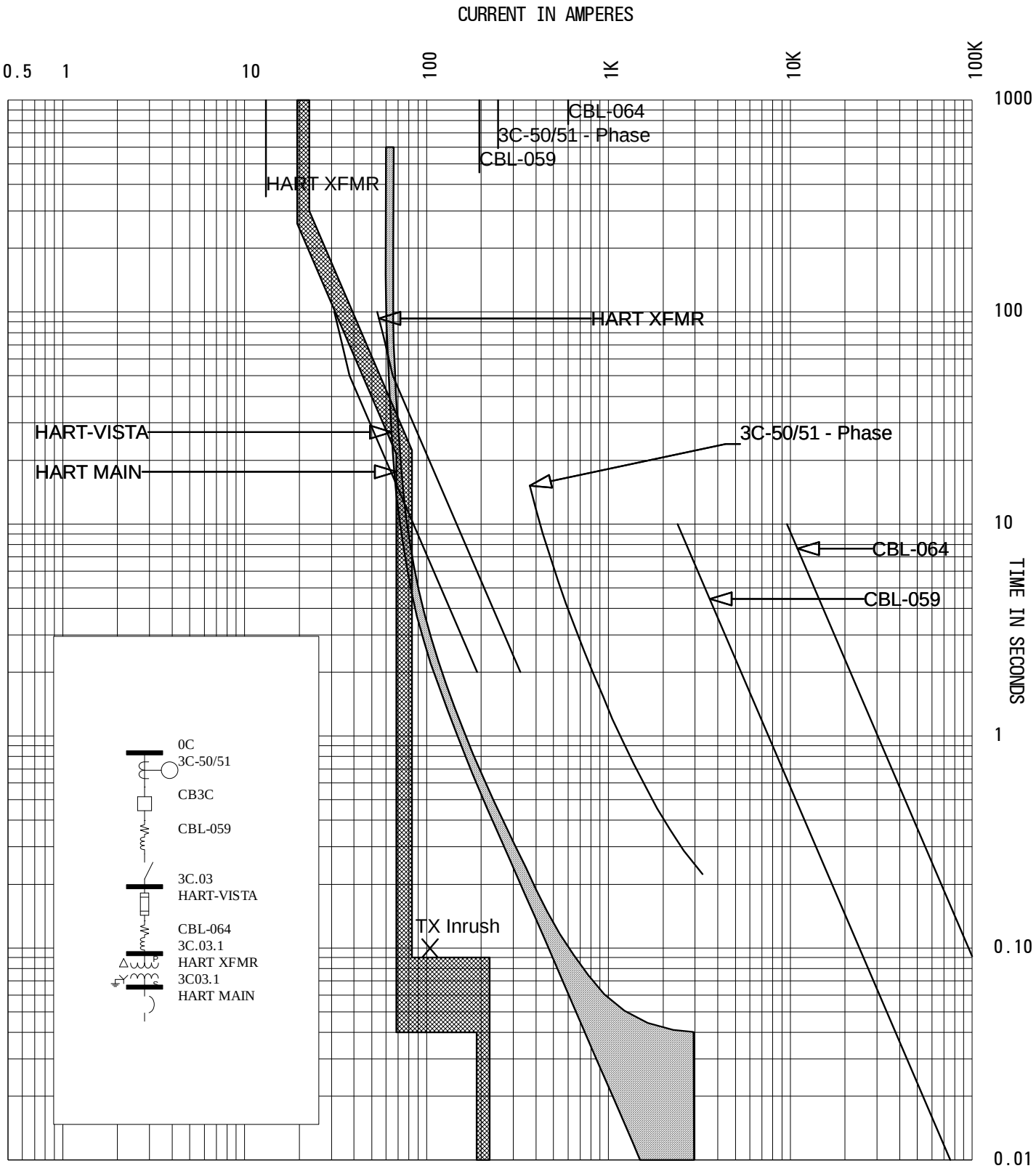
Device Name:	HART-VISTA	TCC Name:	3C-004.tcc
Bus Name:	3C.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2950.5A
Cartridge:	Vista, 30E 15500V 30A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	30A		

Device Name:	CBL-064	TCC Name:	3C-004.tcc
Bus Name:	3C.03	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	HART XFMR	TCC Name:	3C-004.tcc
Bus Name:	3C.03.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	300.0kVA		
Impedance (%Z):	5.4500	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	HART MAIN	TCC Name:	3C-004.tcc
Bus Name:	3C03.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LS, 400-1200A Fixed Plug		
Type:	ND, RMS 310		
AIC Rating:	65kA	Fault Duty:	14128.4A
Frame:	ND 240V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1200A		
Plug:	1200A		

Setting: 1) LTPU (1.0 x P)	Fixed	(1200A)	
2) LTD (Fixed)	Fixed		
3) STPU (2-8 x LTPU)	4	(4800A)	
4) STD (Fixed)	Fixed	I^2 t Out	
5) INST (14000A)	Fixed	(14000A)	



TCC Name: 3C-004
Oneline: 3C-004 - Hart
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Culkin Hall Transformer Primary Overcurrent Device
CULKIN-VISTA

TCC:	3C-001, 005
Existing Device:	S&C Vista Switch
Existing Setting:	Tap Setting Phase: 150A, GF: 50A
Transformer:	2000 kVA, 13.2 – 480Y/277V, (no impedance listed) 87.4 FLA @ 13.2kV, 2405 FLA @ 480V

Fuse
Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 87.4 x 3 = 262.4
Set not less than secondary main device 3200 x (480 / 13200) = 116.4
Set for E Curve 125E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 3C-005.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	3C-50/51	TCC Name:	3C-005.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB3C	TCC Name:	3C-005.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-059	TCC Name:	3C-005.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0418	TCC Name:	3C-005.tcc
Bus Name:	3C.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2850.1A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

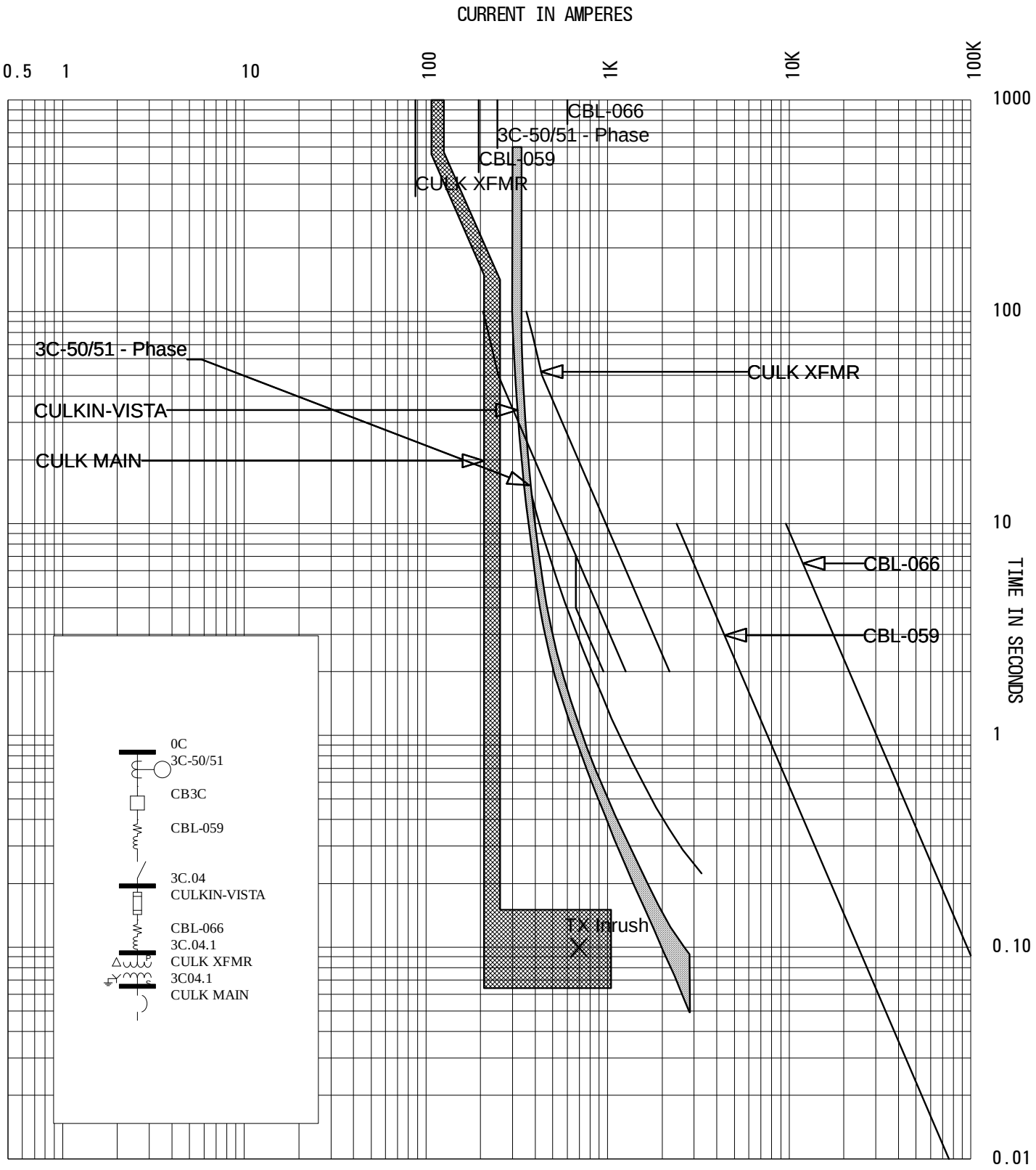
Device Name:	CULKIN-VISTA	TCC Name:	3C-005.tcc
Bus Name:	3C.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2850.1A
Cartridge:	Vista, 125E 15500V 125A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	125A		

Device Name:	CBL-066	TCC Name:	3C-005.tcc
Bus Name:	3C.04	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	CULK XFMR	TCC Name:	3C-005.tcc
Bus Name:	3C.04.1	Bus Voltage:	13200.0V / 480V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/480 LL
Nominal Size:	2000.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	CULK MAIN	TCC Name:	3C-005.tcc
Bus Name:	3C04.1	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LS, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	65kA ShortTime:65	Fault Duty:	28828.9A
Frame:	DS-632 480V 3200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	3200A		
Plug:	3200A		

Setting: 1) LTPU (0.5-1.0 x P)	1	(3200A)	
2) LTD (2-24 Sec.)	20		
3) STPU (2-10 x LTPU)	2	(6400A)	
4) STD (0.1-0.5 Sec.)	0.1 Sec.	I^2 t Out	



TCC Name: 3C-005
Oneline: 3C-005 - Culkin
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

Project Name: SUNY-OSWEGO April 2013
TCC Name: 4B-001.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	CBL-003	TCC Name:	4B-001.tcc
Bus Name:	0.1.2	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1200	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	Main B	TCC Name:	4B-001.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	BUS B 50/51	TCC Name:	4B-001.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	1200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	0.43 (516A)	Test Points:	@2.0X, 3.838s
2) Ext Inverse	2.2 1		@5.0X, 0.544s
			@10.0X, 0.216s

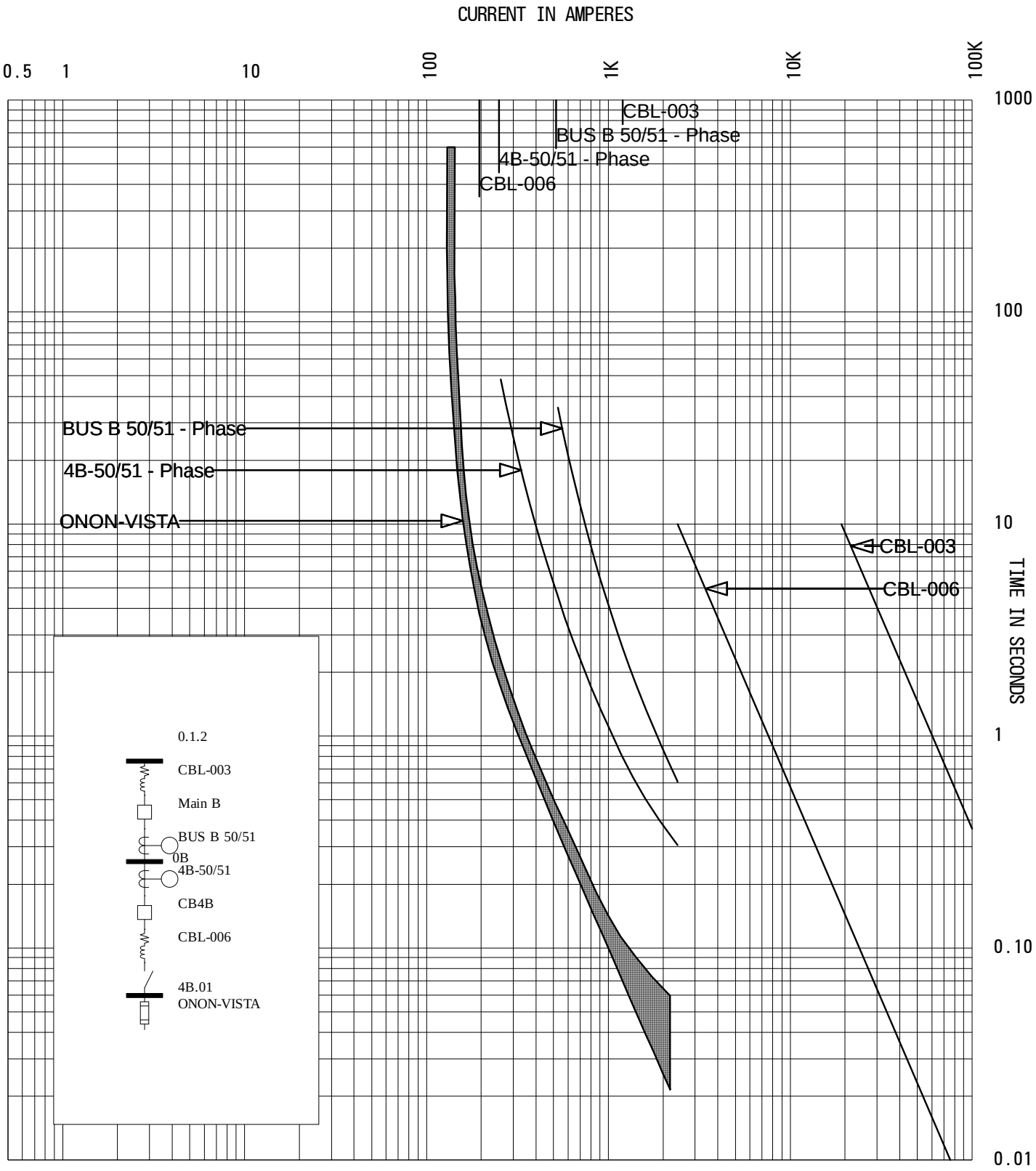
Device Name: 4B-50/51 TCC Name: 4B-001.tcc
Bus Name: 0B Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 2414.8A
Current Rating: 200A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 1.25 (250A) Test Points: @2.0X, 5.233s
2) Ext Inverse 3 1 @5.0X, 0.742s
@10.0X, 0.295s

Device Name: CB4B TCC Name: 4B-001.tcc
Bus Name: 0B Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: CUTLER-HAMMER
Description: 600-3000A
Type: VCP-W
AIC Rating: 18kA Fault Duty: 2414.8A
Frame: 150 VCP-W-500 15000V 1200A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Sensor:
Plug:

Device Name: CBL-006 TCC Name: 4B-001.tcc
Bus Name: 0B Bus Voltage: 13200.0V
Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Description: Cable Damage Curve Qty/Ph: 1
Size: 1/0 Cont. Temp: 90 deg C.
Material: Copper Damage Temp: 250 deg C.

Device Name: PD-0367 TCC Name: 4B-001.tcc
Bus Name: 4B.01 Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer:
Description:
Type:
AIC Rating: 0kA Fault Duty: 2176.6A
Frame: Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
FLA: 0.00A
Setting:

Device Name:	ONON-VISTA	TCC Name:	4B-001.tcc
Bus Name:	4B.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2176.6A
Cartridge:	Vista, 65E 15500V 65A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	65A		



TCC Name: 4B-001
Oneline: 4B-001-Feeder B4
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Onondaga Hall Transformer Primary Overcurrent Device
ONON-VISTA

TCC: 4B-001, 002

Existing Device: S&C Vista Switch

Existing Setting: Tap Setting Phase: 150A, GF: 50A

Transformer: 750 kVA, 13.2 – 208Y/120V (no impedance noted)
32.8 FLA @ 13.2kV, 2081.8 FLA @ 208V

Fuse

Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 32.8 x 3 = 98.4
Set not less than secondary main device 2500 x (208 / 13200) = 39.4
Set for E Curve 65E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 4B-002.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	4B-50/51	TCC Name:	4B-002.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB4B	TCC Name:	4B-002.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-006	TCC Name:	4B-002.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

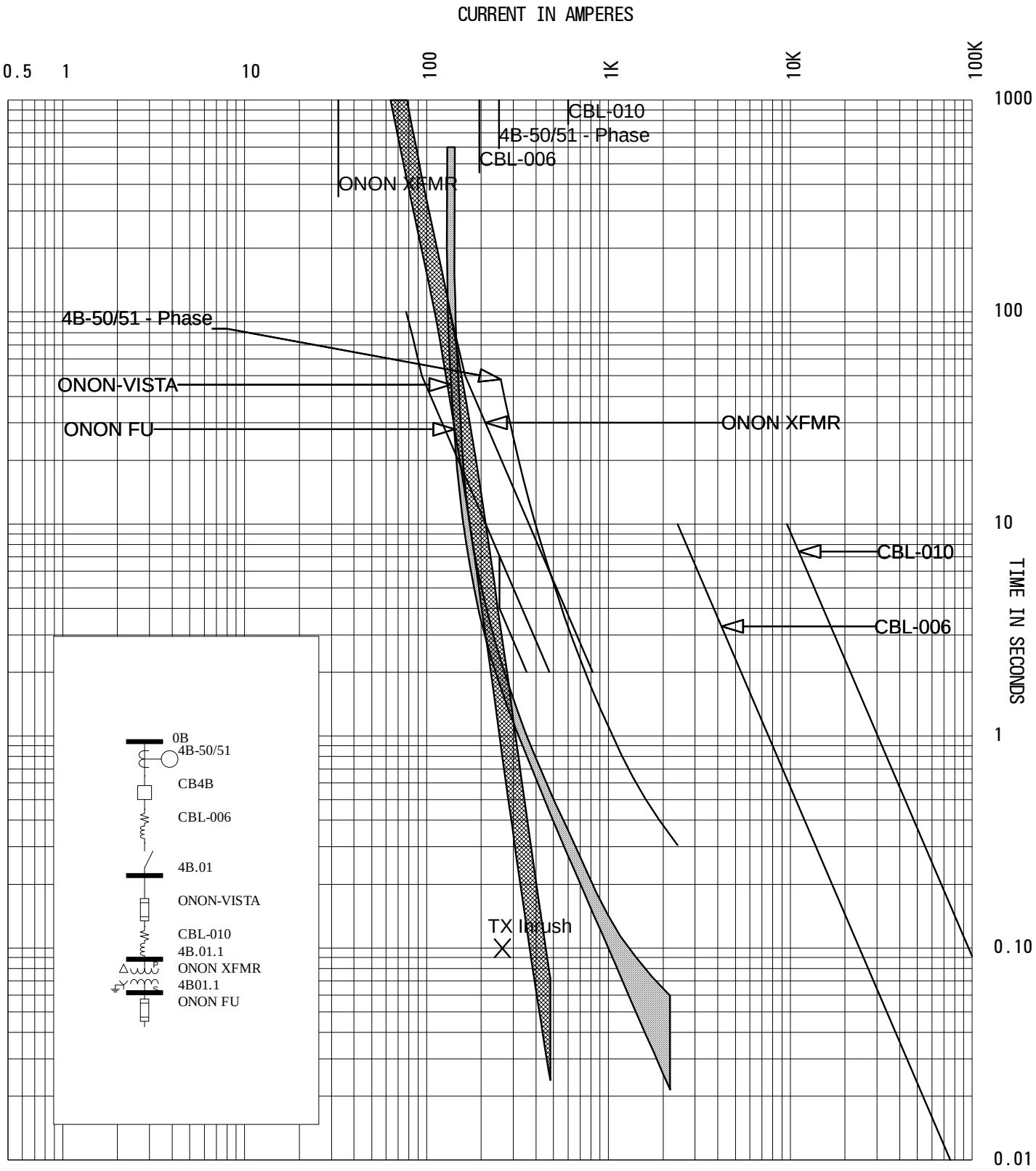
Device Name:	PD-0367	TCC Name:	4B-002.tcc
Bus Name:	4B.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2176.6A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

Device Name:	ONON-VISTA	TCC Name:	4B-002.tcc
Bus Name:	4B.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2176.6A
Cartridge:	Vista, 65E 15500V 65A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	65A		

Device Name:	CBL-010	TCC Name:	4B-002.tcc
Bus Name:	4B.01	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	ONON XFMR	TCC Name:	4B-002.tcc
Bus Name:	4B.01.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	750.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	ONON FU	TCC Name:	4B-002.tcc
Bus Name:	4B01.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	GOULD SHAWMUT		
Description:	200-6000A		
Type:	A4BY, 600V Class L		
AIC Rating:	200kA	Fault Duty:	30508.8A
Cartridge:	A4BY 600V 2500A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	2500A		



TCC Name: 4B-002
Oneline: 4B-002 - Onondaga
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Onieda Hall Transformer Primary Overcurrent Device
ONEIDA-VISTA

TCC: 4B-003

Existing Device: S&C Vista Switch

Existing Setting: Tap Setting Phase: 80A, GF: 50A

Transformer: 300 kVA, 13.2 – 208Y/120V (no impedance noted)
13.1 FLA @ 13.2kV, 832.7 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 13.1 x 3 = 39.4
Set not less than secondary main device 1200 x (208 / 13200) = 18.9
Set for E Curve 30E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 4B-003.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	4B-50/51	TCC Name:	4B-003.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB4B	TCC Name:	4B-003.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-006	TCC Name:	4B-003.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0369	TCC Name:	4B-003.tcc
Bus Name:	4B.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2134.1A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

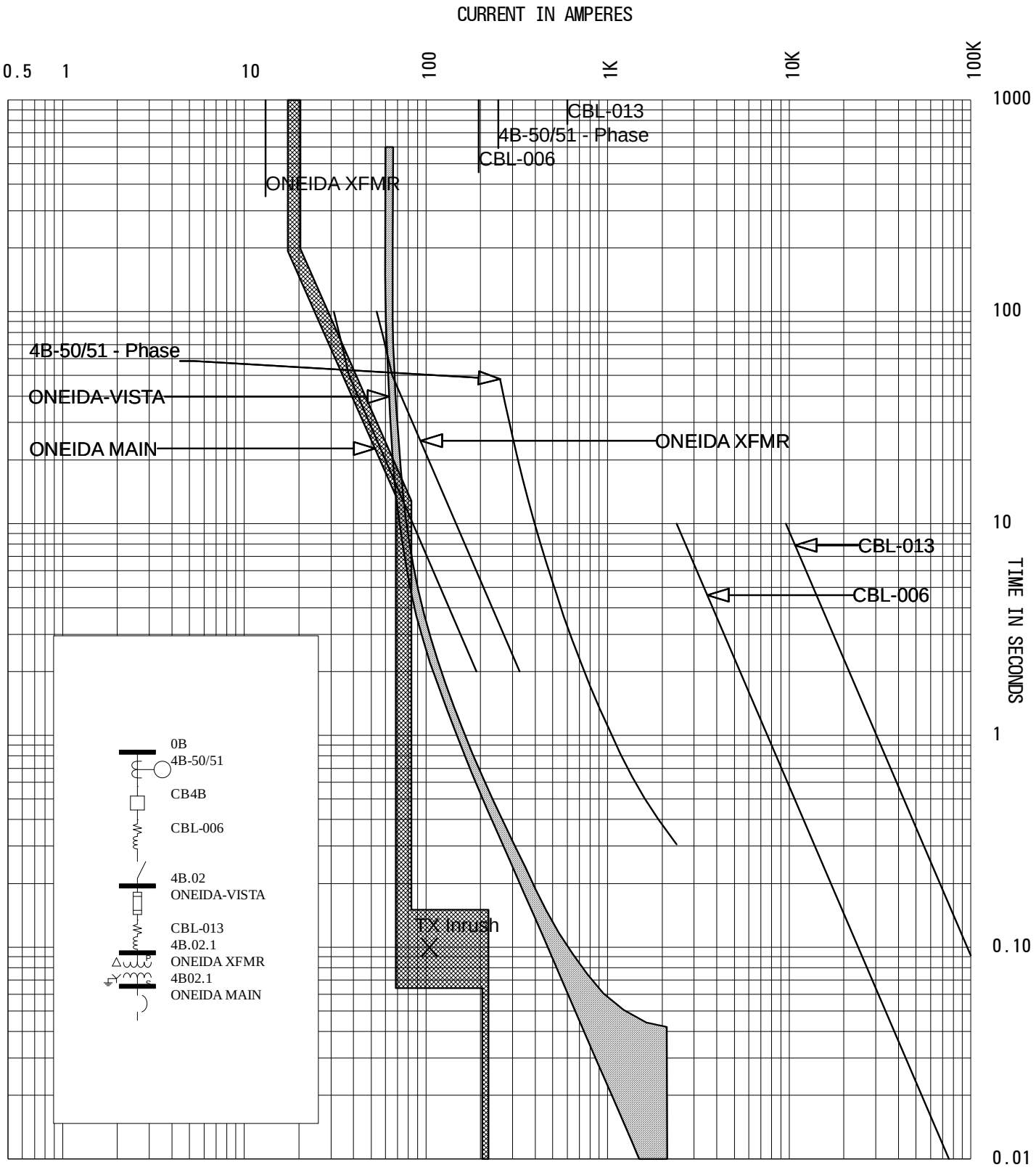
Device Name:	ONEIDA-VISTA	TCC Name:	4B-003.tcc
Bus Name:	4B.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2134.1A
Cartridge:	Vista, 30E 15500V 30A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	30A		

Device Name:	CBL-013	TCC Name:	4B-003.tcc
Bus Name:	4B.02	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	ONEIDA XFMR	TCC Name:	4B-003.tcc
Bus Name:	4B.02.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	300.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	ONEIDA MAIN	TCC Name:	4B-003.tcc
Bus Name:	4B02.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	65kA ShortTime:65	Fault Duty:	14035.3A
Frame:	DS-416H 240V 1600A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1600A		
Plug:	1200A		

Setting: 1) LTPU (0.5-1.0 x P)	1	(1200A)	
2) LTD (2-24 Sec.)	7		
3) STPU (2-10 x LTPU)	4	(4800A)	
4) STD (0.1-0.5 Sec.)	0.1 Sec.	I^2 t Out	
5) INST (2-12 x P)	M2(12)	(14400A)	



TCC Name: 4B-003
Oneline: 4B-003 - Oneida
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Little Page Transformer Primary Overcurrent Device
L PAGE-VISTA

TCC: 4B-004

Existing Device: S&C Vista Switch

Existing Setting: Tap Setting Phase: 80A, GF: 50A

Transformer: 300 kVA, 13.2 – 208Y/120V (no impedance noted)
13.1 FLA @ 13.2kV, 832.7 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 13.1 x 3 = 39.4
Set not less than secondary main device 1200 x (208 / 13200) = 18.9
Set for E Curve 30E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 4B-004.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	4B-50/51	TCC Name:	4B-004.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB4B	TCC Name:	4B-004.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-006	TCC Name:	4B-004.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0373	TCC Name:	4B-004.tcc
Bus Name:	4B.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2111.5A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

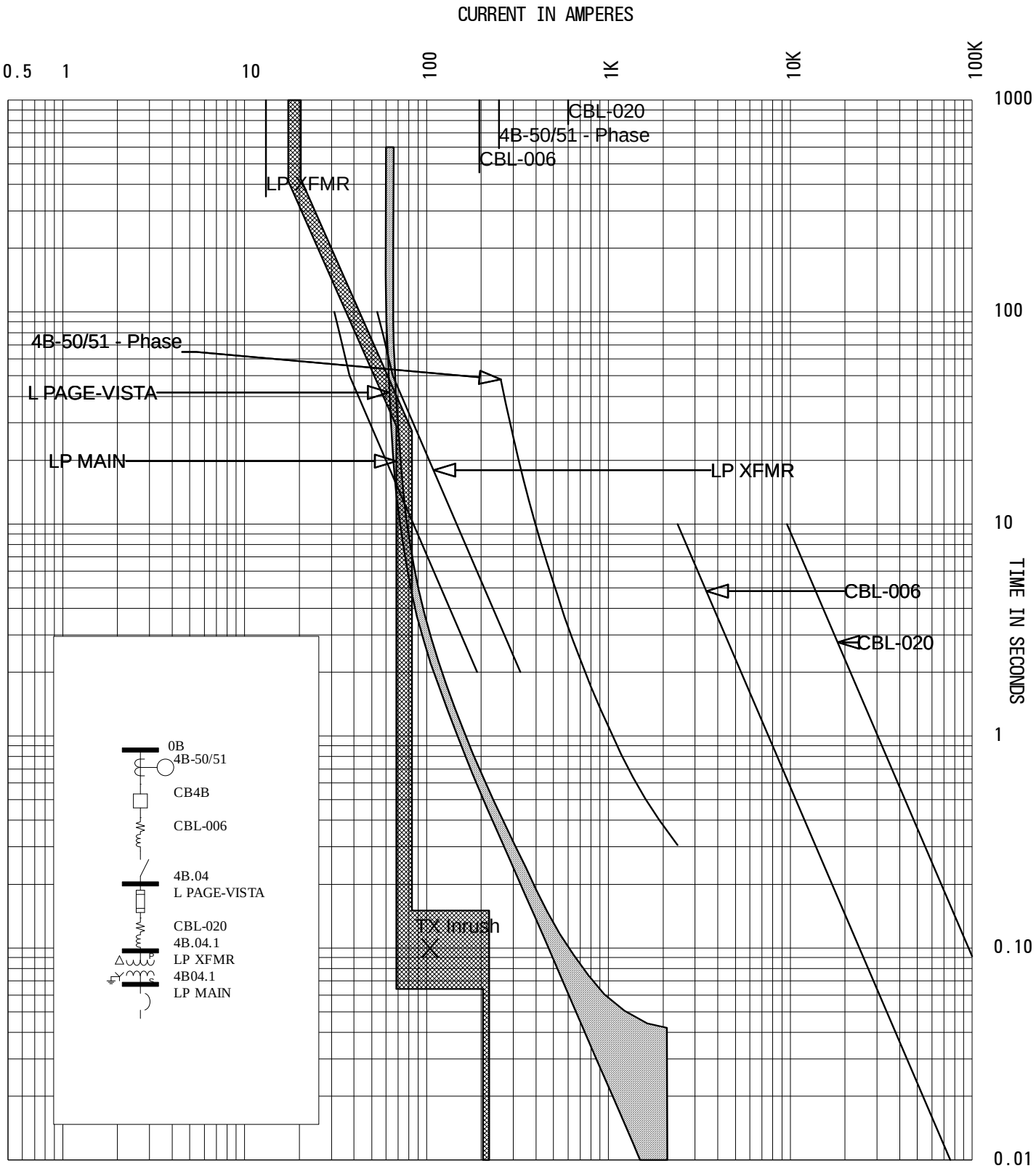
Device Name:	L PAGE-VISTA	TCC Name:	4B-004.tcc
Bus Name:	4B.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2111.5A
Cartridge:	Vista, 30E 15500V 30A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	30A		

Device Name:	CBL-020	TCC Name:	4B-004.tcc
Bus Name:	4B.04	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	LP XFMR	TCC Name:	4B-004.tcc
Bus Name:	4B.04.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	300.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	LP MAIN	TCC Name:	4B-004.tcc
Bus Name:	4B04.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	65kA ShortTime:65	Fault Duty:	14021.3A
Frame:	DS-416H 240V 1600A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1600A		
Plug:	1200A		

Setting: 1) LTPU (0.5-1.0 x P)	1	(1200A)	
2) LTD (2-24 Sec.)	15		
3) STPU (2-10 x LTPU)	4	(4800A)	
4) STD (0.1-0.5 Sec.)	0.1 Sec.	I^2 t Out	
5) INST (2-12 x P)	M2(12)	(14400A)	



TCC Name: 4B-004
Oneline: 4B-004 - Little Page
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Cayuga Hall Transformer Primary Overcurrent Device
CAYUGA-VISTA

TCC: 4B-005

Existing Device: S&C Vista Switch

Existing Setting: Tap Setting Phase: 80A, GF: 50A

Transformer: 300 kVA, 13.2 – 208Y/120V (no impedance noted)
13.1 FLA @ 13.2kV, 832.7 FLA @ 208V

Fuse

Set not more than 67% of the upstream device 250 x 0.67 = 167.5
Set not more than 300% transformer FLA 13.1 x 3 = 39.4
Set not less than secondary main device 1200 x (208 / 13200) = 18.9
Set for E Curve 30E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 4B-005.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	4B-50/51	TCC Name:	4B-005.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	2414.8A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	1.25 (250A)	Test Points:	@2.0X, 5.233s
2) Ext Inverse	3 1		@5.0X, 0.742s
			@10.0X, 0.295s

Device Name:	CB4B	TCC Name:	4B-005.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-006	TCC Name:	4B-005.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0375	TCC Name:	4B-005.tcc
Bus Name:	4B.05	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2077.0A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

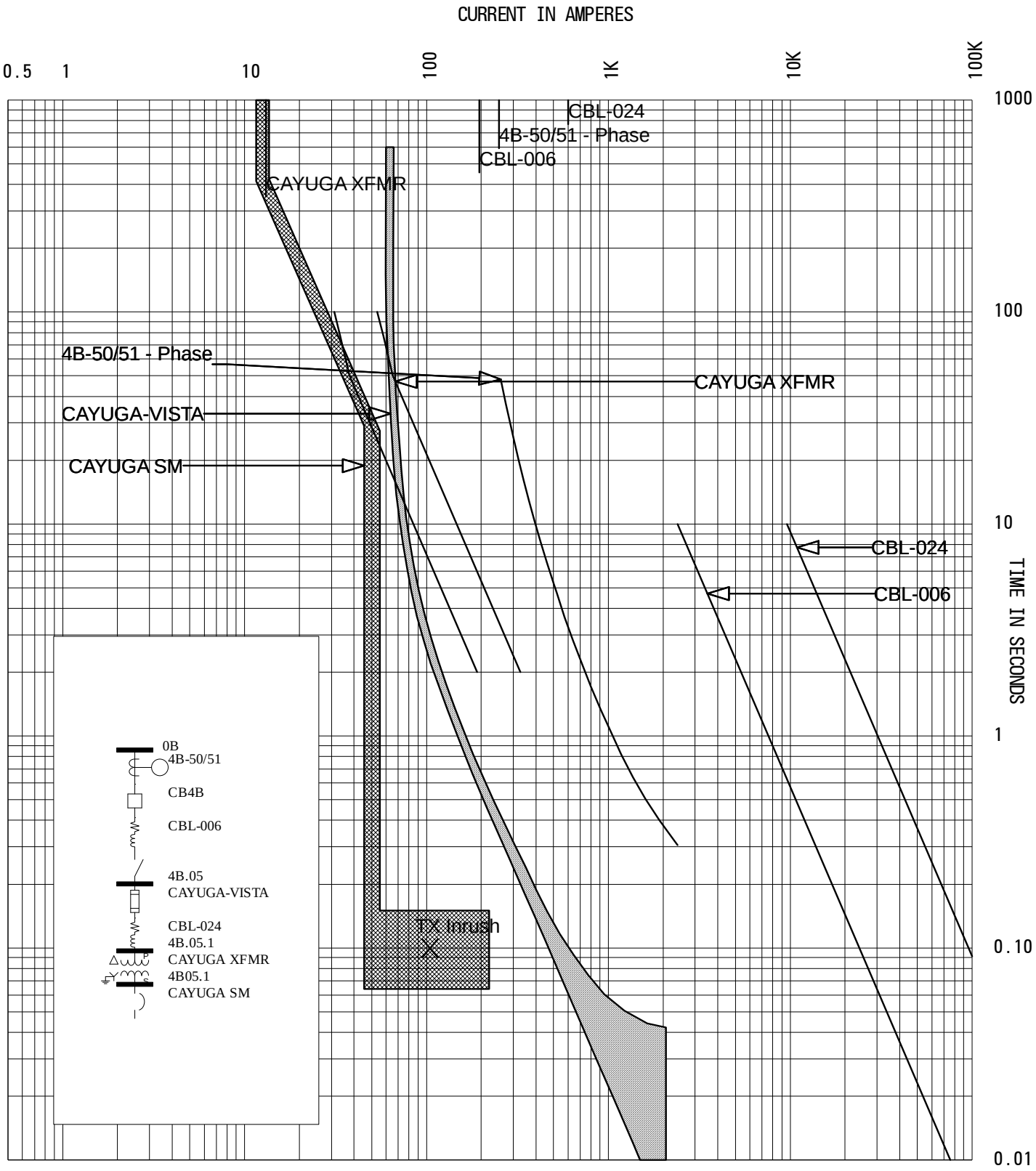
Device Name:	CAYUGA-VISTA	TCC Name:	4B-005.tcc
Bus Name:	4B.05	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2077.0A
Cartridge:	Vista, 30E 15500V 30A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	30A		

Device Name:	CBL-024	TCC Name:	4B-005.tcc
Bus Name:	4B.05	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	CAYUGA XFMR	TCC Name:	4B-005.tcc
Bus Name:	4B.05.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	300.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	CAYUGA SM	TCC Name:	4B-005.tcc
Bus Name:	4B05.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	65kA ShortTime:65	Fault Duty:	13999.8A
Frame:	DS-416H 240V 1600A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1600A		
Plug:	1600A		

Setting: 1) LTPU (0.5-1.0 x P)	0.5	(800A)	
2) LTD (2-24 Sec.)	15		
3) STPU (2-10 x LTPU)	4	(3200A)	
4) STD (0.1-0.5 Sec.)	0.1 Sec.	I^2 t Out	
5) INST (2-12 x P)	M2(12)	(19200A)	



TCC Name: 4B-005
Oneline: 4B-005 - Cayuga
April 26, 2013 11:31 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

Project Name: SUNY-OSWEGO April 2013
TCC Name: 4C-001.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	CBL-084	TCC Name:	4C-001.tcc
Bus Name:	0.3.2	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1200	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	Main C	TCC Name:	4C-001.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	BUS C 50/51	TCC Name:	4C-001.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	351-0, -1, -2, -3, -4	Class Desc:	351-1
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	600A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51PP	4.8 (576A)	Test Points:	@2.0X, 3.335s
2) U3, Very Inv	2.4		@5.0X, 0.619s
			@10.0X, 0.325s

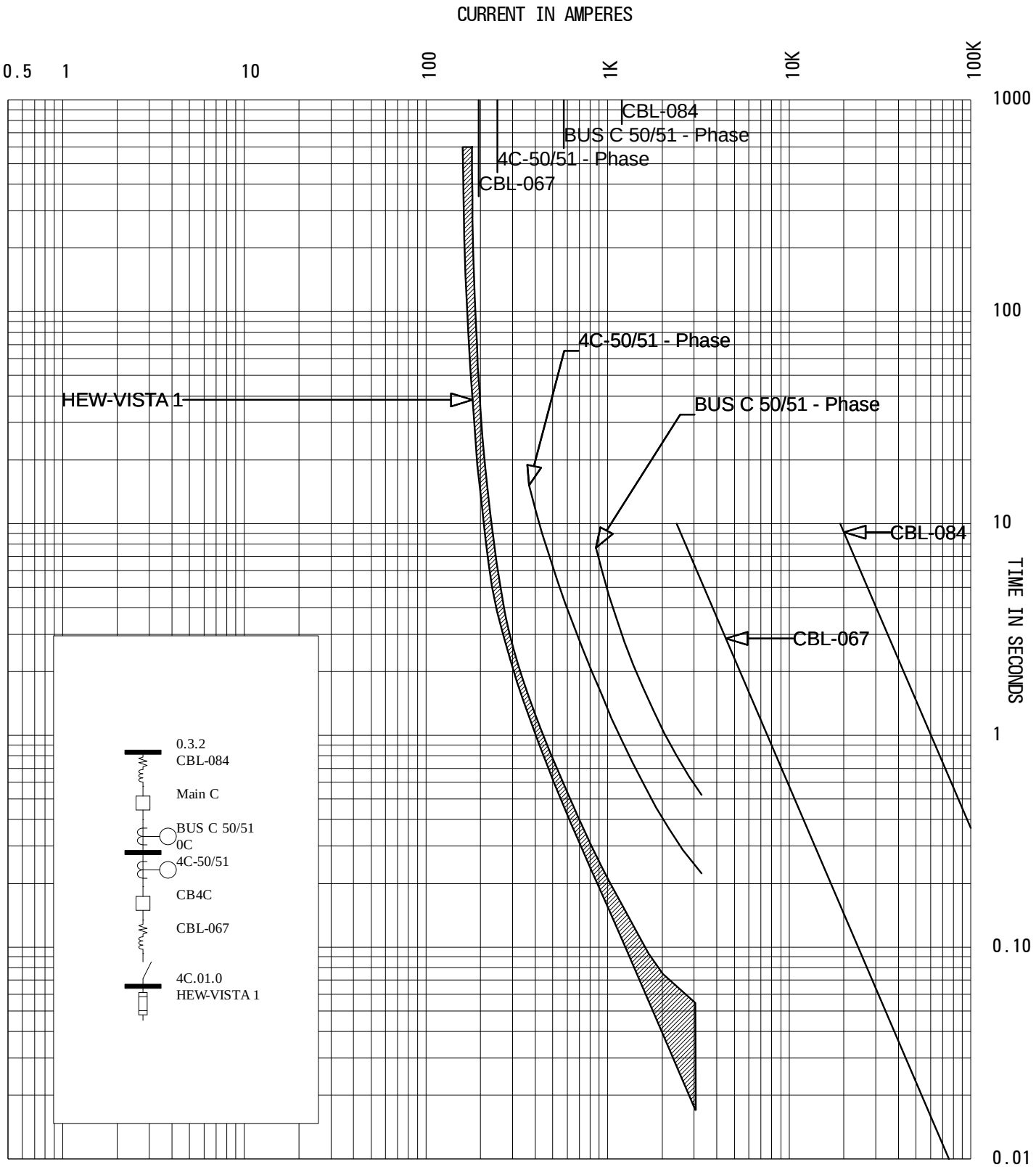
Device Name: 4C-50/51 TCC Name: 4C-001.tcc
Bus Name: 0C Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: SEL
Description: 50P/51P, 5A nom.
Type: 751A Class Desc: SEL751A
AIC Rating: N/A Fault Duty: 3300.1A
Current Rating: 400A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) 51P1P, (0.5-16 x CTR 3.1 (248A) Test Points: @2.0X, 6.353s
2) U4, Extremely Invers 3.3 @5.0X, 0.896s
@10.0X, 0.305s

Device Name: CB4C TCC Name: 4C-001.tcc
Bus Name: 0C Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: CUTLER-HAMMER
Description: 600-3000A
Type: VCP-W
AIC Rating: 18kA Fault Duty: 3300.1A
Frame: 150 VCP-W-500 15000V 1200A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Sensor:
Plug:

Device Name: CBL-067 TCC Name: 4C-001.tcc
Bus Name: 0C Bus Voltage: 13200.0V
Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Description: Cable Damage Curve Qty/Ph: 1
Size: 1/0 Cont. Temp: 90 deg C.
Material: Copper Damage Temp: 250 deg C.

Device Name: Hewitt TCC Name: 4C-001.tcc
Bus Name: 4C.01.0 Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer:
Description:
Type:
AIC Rating: 0kA Fault Duty: 3060.2A
Frame: Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
FLA: 0.00A
Setting:

Device Name:	HEW-VISTA 1	TCC Name:	4C-001.tcc
Bus Name:	4C.01.0	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	3060.2A
Cartridge:	Vista, 80E 15500V 80A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	80A		



TCC Name: 4C-001
Oneline: 4C-001 - Feeder 4C
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Hewitt Union #1 Transformer Primary Overcurrent Device
HEW-VISTA 1

TCC: 4C-001, 002

Existing Device: S&C Vista Switch

Existing Setting: Tap Setting Phase: 150A, GF: 50A

Transformer: 1000 kVA, 13.2 – 208Y/120V (no impedance listed)
43.7 FLA @ 13.2kV, 2776 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 43.7 x 3 = 131.2
Set not less than secondary main device 3200 x (208 / 13200) = 50.4
Set for E Curve 80E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 4C-002.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	4C-50/51	TCC Name:	4C-002.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB4C	TCC Name:	4C-002.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-067	TCC Name:	4C-002.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	Hewitt	TCC Name:	4C-002.tcc
Bus Name:	4C.01.0	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	3060.2A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

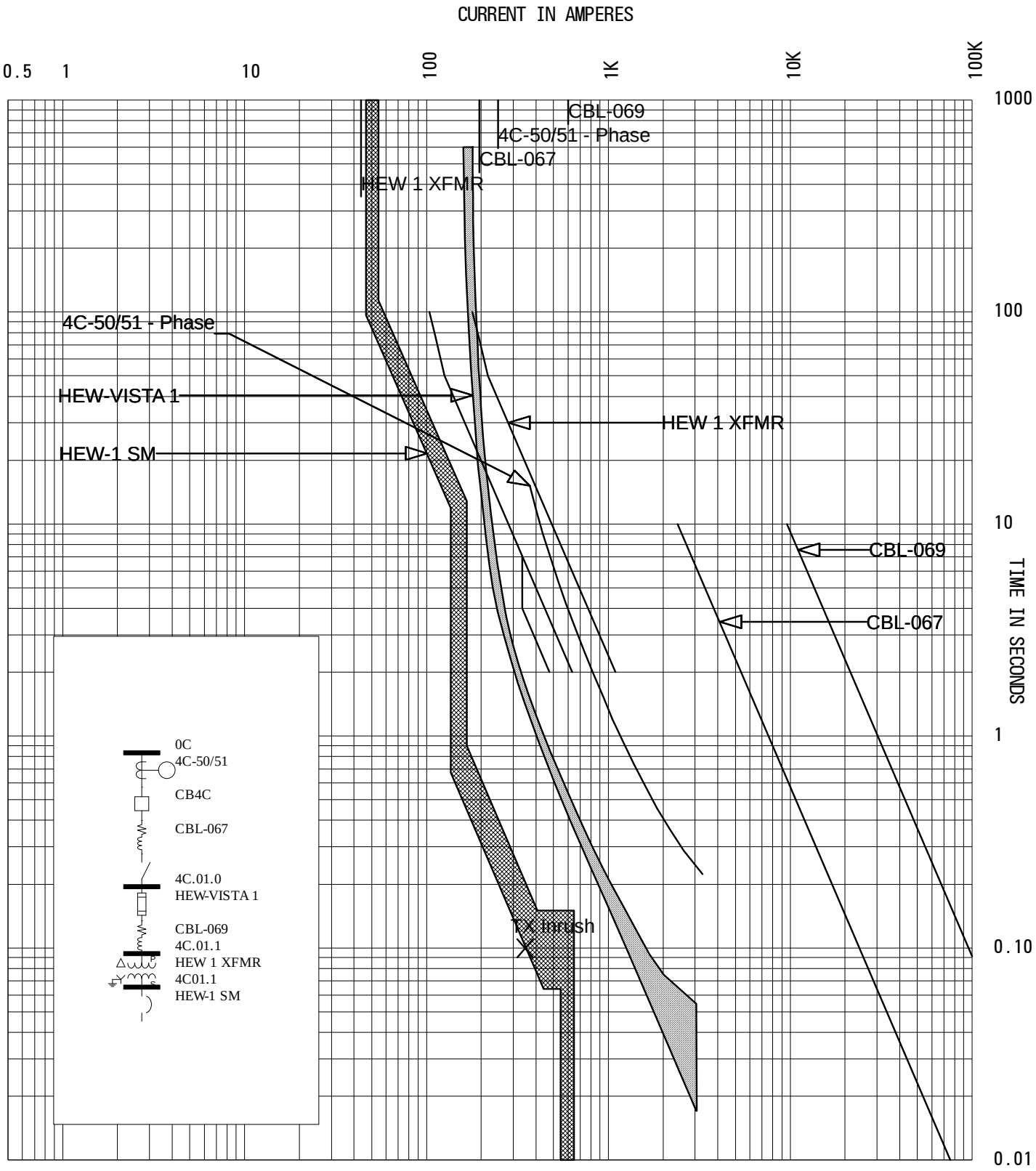
Device Name:	HEW-VISTA 1	TCC Name:	4C-002.tcc
Bus Name:	4C.01.0	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	3060.2A
Cartridge:	Vista, 80E 15500V 80A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	80A		

Device Name:	CBL-069	TCC Name:	4C-002.tcc
Bus Name:	4C.01.0	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	HEW 1 XFMR	TCC Name:	4C-002.tcc
Bus Name:	4C.01.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	1000.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	HEW-1 SM	TCC Name:	4C-002.tcc
Bus Name:	4C01.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	85kA ShortTime:65	Fault Duty:	41150.8A
Frame:	DS-632 240V 3200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	3200A		
Plug:	3200A		

Setting:			
1) LTPU (0.5-1.0 x P)	1	(3200A)	
2) LTD (2-24 Sec.)	4		
3) STPU (2-10 x LTPU)	3	(9600A)	
4) STD (0.1-0.5 Sec.)	0.1 Sec.	I^2 t In	
5) INST (2-12 x P)	M2(12)	(38400A)	



TCC Name: 4C-002
Oneline: 4C-002 - Hewitt 1
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Hewitt Union #2 Transformer Primary Overcurrent Device
HEW-VISTA 2

TCC: 4C-003

Existing Device: S&C Vista Switch

Existing Setting: E Curve 65E

Transformer: 500 kVA, 13.2 – 480Y/277V (no impedance listed)
21.9FLA @ 13.2kV, 601 FLA @ 480V

Fuse

Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 21.9 x 3 = 65.6
Set not less than secondary main device 800 x (480 / 13200) = 29.1
Set for E Curve 65E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 4C-003.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	4C-50/51	TCC Name:	4C-003.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB4C	TCC Name:	4C-003.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-067	TCC Name:	4C-003.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	Hewitt	TCC Name:	4C-003.tcc
Bus Name:	4C.01.0	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	3060.2A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

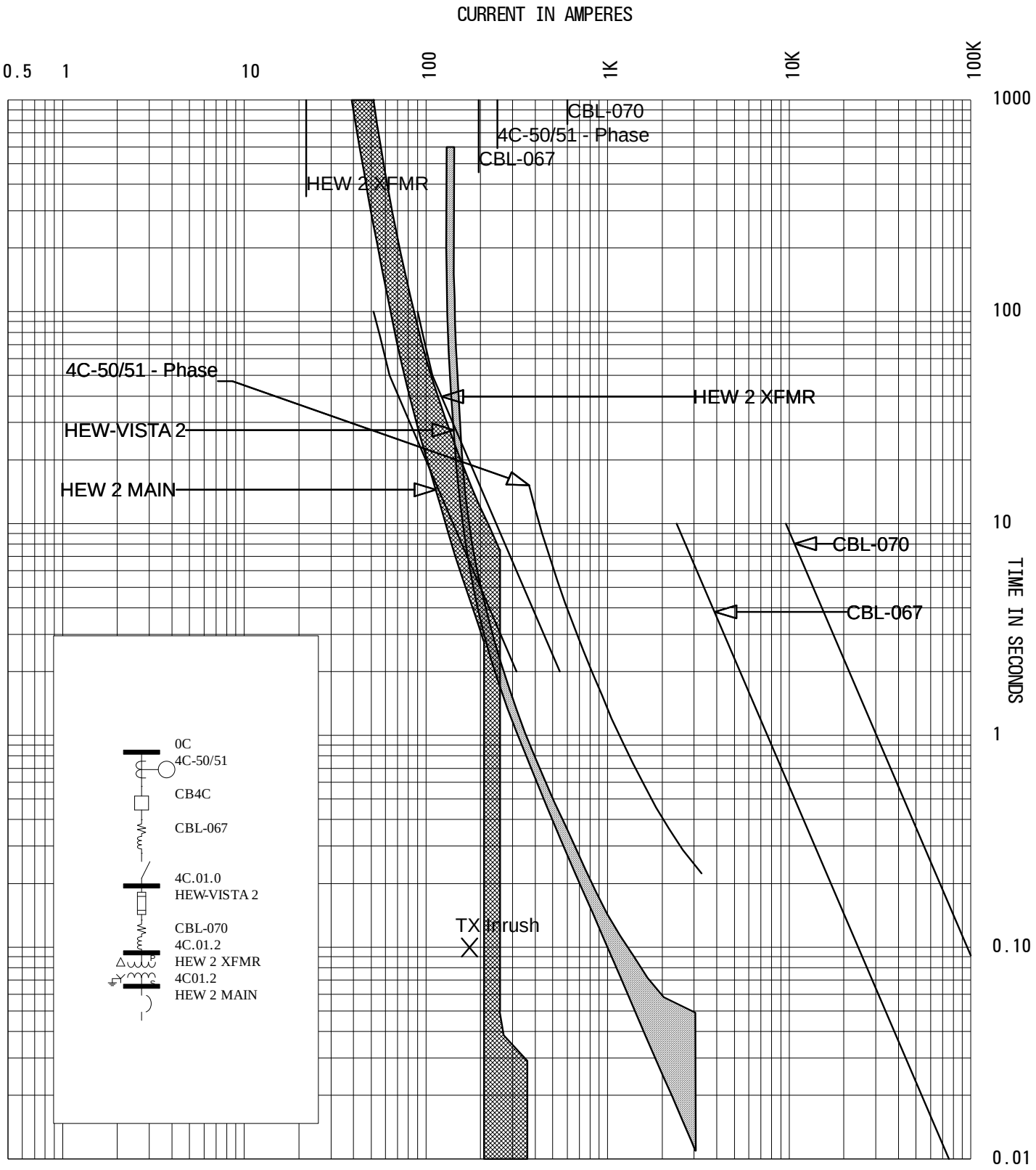
Device Name:	HEW-VISTA 2	TCC Name:	4C-003.tcc
Bus Name:	4C.01.0	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	3060.2A
Cartridge:	Vista, 65E 15500V 65A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	65A		

Device Name:	CBL-070	TCC Name:	4C-003.tcc
Bus Name:	4C.01.0	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	HEW 2 XFMR	TCC Name:	4C-003.tcc
Bus Name:	4C.01.2	Bus Voltage:	13200.0V / 480V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/480 LL
Nominal Size:	500.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	HEW 2 MAIN	TCC Name:	4C-003.tcc
Bus Name:	4C01.2	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	300-800A		
Type:	MDL		
AIC Rating:	50kA	Fault Duty:	9966.4A
Frame:	MDL 480V 800A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	800A		

Setting: 1) Thermal Curve (Fixed
2) INST (4-8 x Trip) 8 (6400A)



TCC Name: 4C-003
Oneline: 4C-003 - Hewitt 2
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Tyler Hall #1 Transformer Primary Overcurrent Device
TY-1-VISTA

TCC: 4C-004

Existing Device: S&C Vista Switch

Existing Setting: Tap Setting Phase: 150A, GF: 50A

Transformer: 1000 kVA, 13.2 – 208Y/120V (no impedance listed)
43.7 FLA @ 13.2kV, 2776 FLA @ 208V

Fuse

Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 43.7 x 3 = 131.2
Set not less than secondary main device 3200 x (208 / 13200) = 50.4
Set for E Curve 80E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 4C-004.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	4C-50/51	TCC Name:	4C-004.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB4C	TCC Name:	4C-004.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-067	TCC Name:	4C-004.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0358	TCC Name:	4C-004.tcc
Bus Name:	4C.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2995.2A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

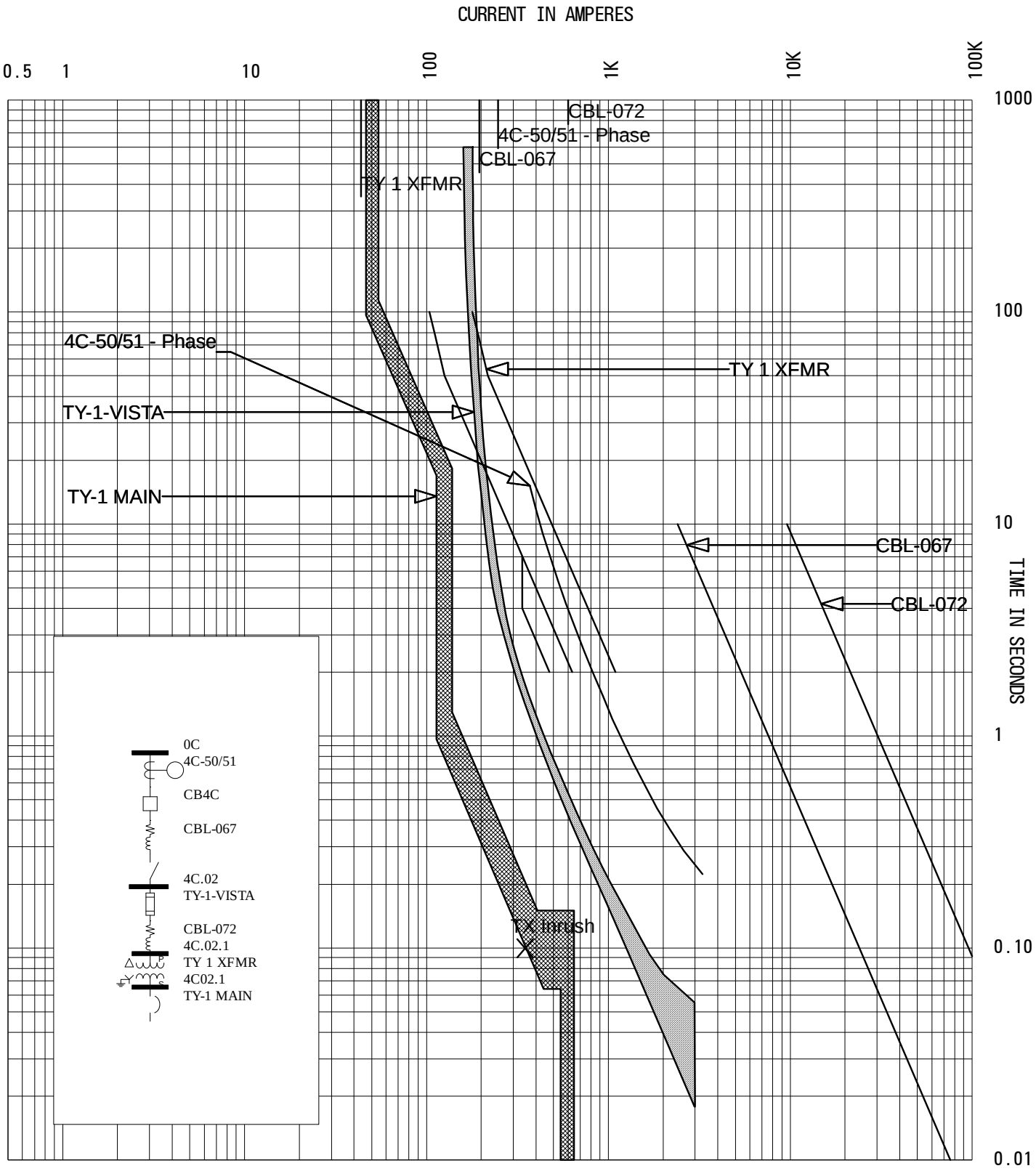
Device Name:	TY-1-VISTA	TCC Name:	4C-004.tcc
Bus Name:	4C.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2995.2A
Cartridge:	Vista, 80E 15500V 80A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	80A		

Device Name:	CBL-072	TCC Name:	4C-004.tcc
Bus Name:	4C.02	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	TY 1 XFMR	TCC Name:	4C-004.tcc
Bus Name:	4C.02.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	1000.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	TY-1 MAIN	TCC Name:	4C-004.tcc
Bus Name:	4C02.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	85kA ShortTime:65	Fault Duty:	40982.6A
Frame:	DS-632 240V 3200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	3200A		
Plug:	3200A		

Setting: 1) LTPU (0.5-1.0 x P)	1	(3200A)	
2) LTD (2-24 Sec.)	4		
3) STPU (2-10 x LTPU)	2.5	(8000A)	
4) STD (0.1-0.5 Sec.)	0.1 Sec.	I^2 t In	
5) INST (2-12 x P)	M2(12)	(38400A)	



TCC Name: 4C-004
Oneline: 4C-004 - Tyler 1
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Tyler Hall #2 Transformer Primary Overcurrent Device
TY-2-VISTA

TCC:	4C-005
Existing Device:	S&C Vista Switch
Existing Setting:	Tap Setting Phase: 65A, GF: 50A
Transformer:	225 kVA, 13.2 – 480Y/277V (no impedance listed) 9.8 FLA @ 13.2kV, 270 FLA @ 480V

<u>Fuse</u>
Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 9.8 x 3 = 29.5
Set not less than secondary main device 225 x (480 / 13200) = 8.2
Set for E Curve 25E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 4C-005.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	4C-50/51	TCC Name:	4C-005.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB4C	TCC Name:	4C-005.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-067	TCC Name:	4C-005.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

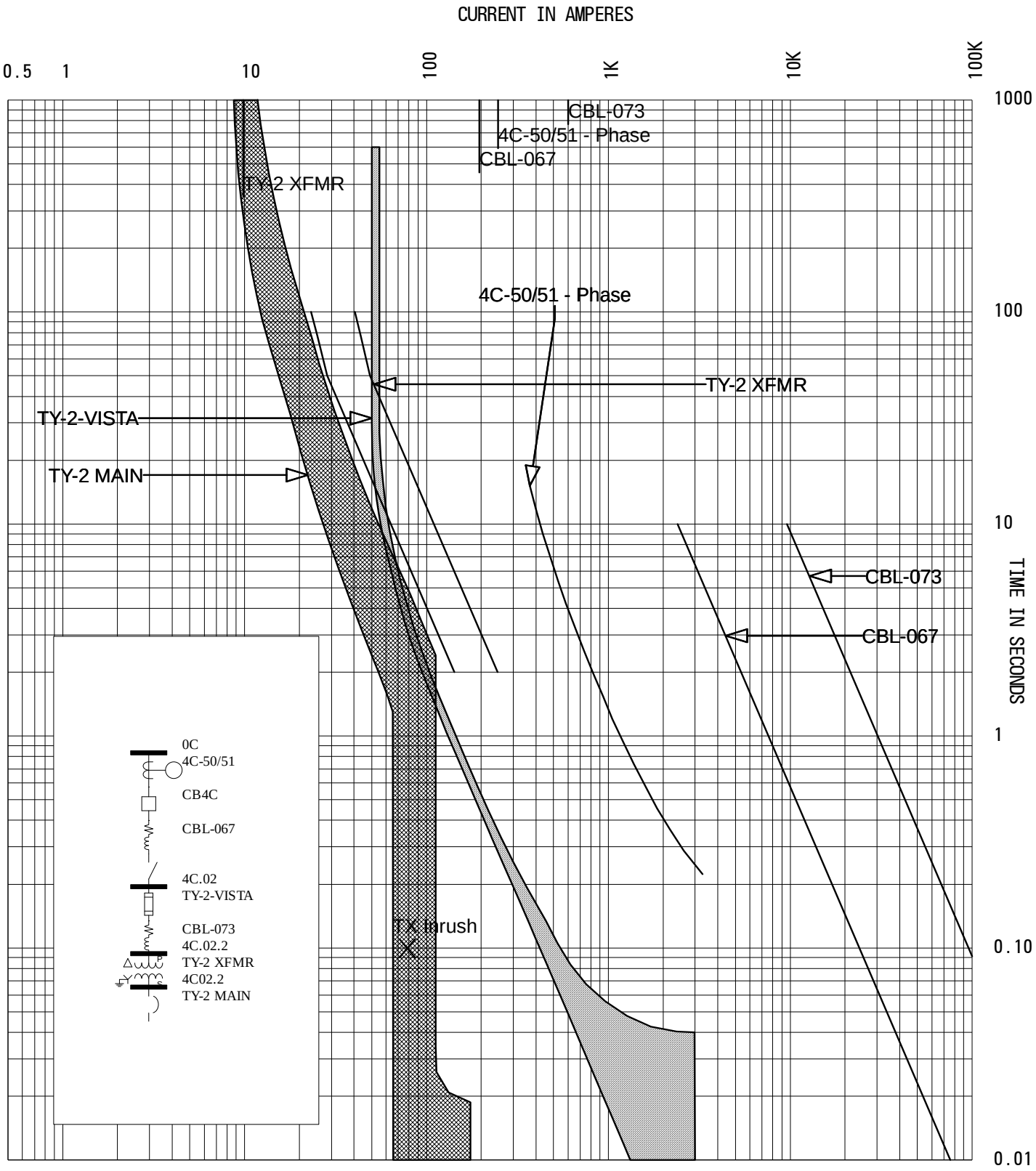
Device Name:	PD-0358	TCC Name:	4C-005.tcc
Bus Name:	4C.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2995.2A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

Device Name:	TY-2-VISTA	TCC Name:	4C-005.tcc
Bus Name:	4C.02	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2995.2A
Cartridge:	Vista, 25E 15500V 25A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	25A		

Device Name:	CBL-073	TCC Name:	4C-005.tcc
Bus Name:	4C.02	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	TY-2 XFMR	TCC Name:	4C-005.tcc
Bus Name:	4C.02.2	Bus Voltage:	13200.0V / 480V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/480 LL
Nominal Size:	225.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	TY-2 MAIN	TCC Name:	4C-005.tcc
Bus Name:	4C02.2	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	15-225A		
Type:	HFD		
AIC Rating:	65kA	Fault Duty:	4791.5A
Frame:	HFD 480V 225A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	225A		
Setting: 1) Fixed			



TCC Name: 4C-005
Oneline: 4C-005 - Tyler 2
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Pathfinder Transformer Primary Overcurrent Device
PATH-VISTA

TCC: 4C-006

Existing Device: S&C Vista Switch

Existing Setting: Tap Setting Phase: 80A, GF: 50A

Transformer: 300 kVA, 13.2 – 208Y/120V (no impedance listed)
13.1 FLA @ 13.2kV, 832.7 FLA @ 208V

Fuse
Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 13.1 x 3 = 39.4
Set not less than secondary main device 1200 x (208 / 13200) = 18.9
Set for E Curve 30E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 4C-006.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	4C-50/51	TCC Name:	4C-006.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB4C	TCC Name:	4C-006.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-067	TCC Name:	4C-006.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0359	TCC Name:	4C-006.tcc
Bus Name:	4C.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2913.6A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

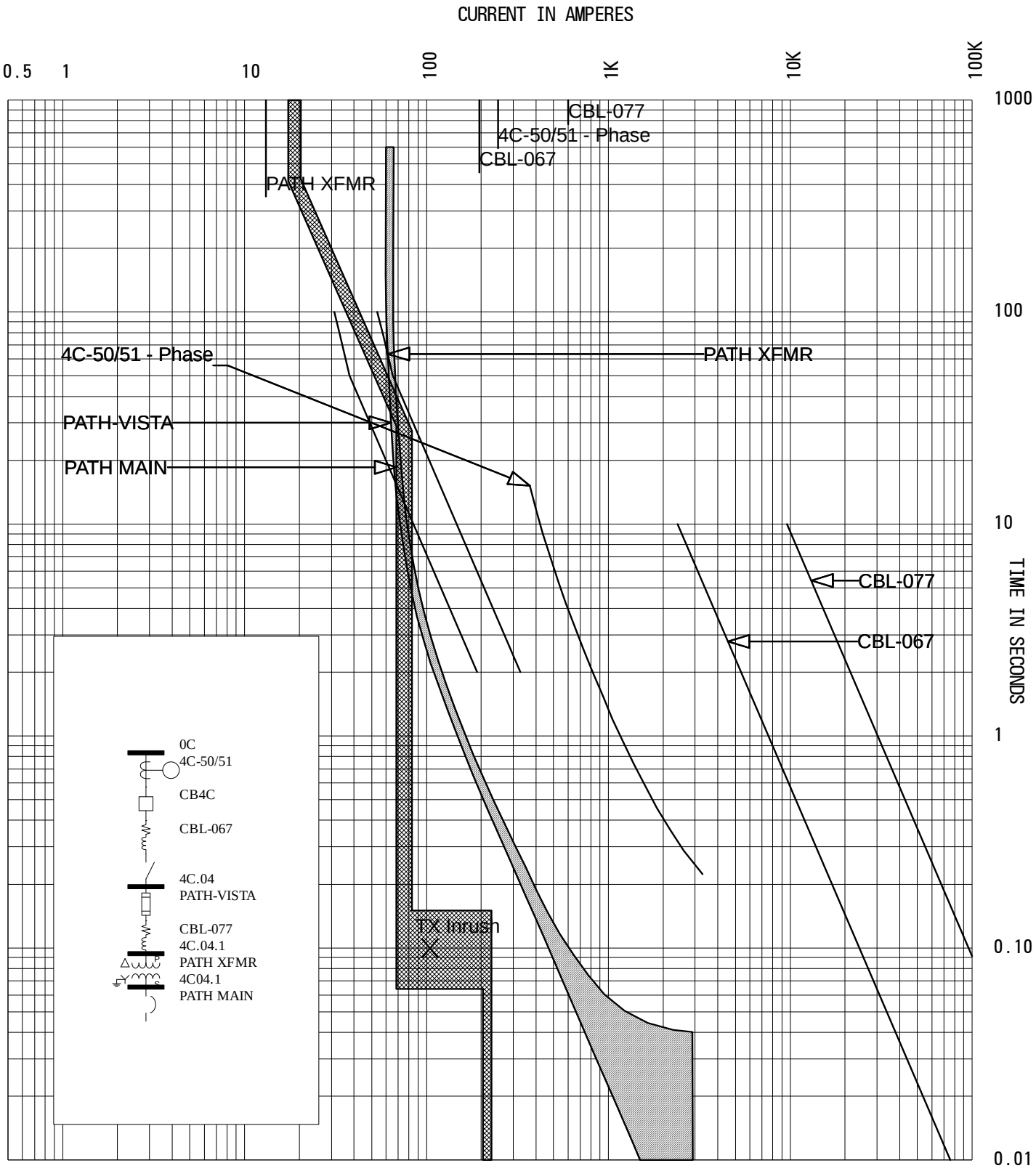
Device Name:	PATH-VISTA	TCC Name:	4C-006.tcc
Bus Name:	4C.04	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2913.6A
Cartridge:	Vista, 30E 15500V 30A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	30A		

Device Name:	CBL-077	TCC Name:	4C-006.tcc
Bus Name:	4C.04	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	PATH XFMR	TCC Name:	4C-006.tcc
Bus Name:	4C.04.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	300.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	PATH MAIN	TCC Name:	4C-006.tcc
Bus Name:	4C04.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	65kA ShortTime:65	Fault Duty:	14435.6A
Frame:	DS-416H 240V 1600A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	1600A		
Plug:	1200A		

Setting: 1) LTPU (0.5-1.0 x P)	1	(1200A)	
2) LTD (2-24 Sec.)	15		
3) STPU (2-10 x LTPU)	4	(4800A)	
4) STD (0.1-0.5 Sec.)	0.1 Sec.	I^2 t Out	
5) INST (2-12 x P)	M2(12)	(14400A)	



TCC Name: 4C-006
Oneline: 4C-006 - Pathfinder
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Seneca Hall Transformer Primary Overcurrent Device
SEN-VISTA

TCC: 4C-007

Existing Device: S&C Vista Switch

Existing Setting: Tap Setting Phase: 150A, GF: 50A

Transformer: 750 kVA, 13.2 – 208Y/120V (no impedance listed)
32.8 FLA @ 13.2kV, 2081.8 FLA @ 208V

Fuse

Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 32.8 x 3 = 98.4
Set not less than secondary main device 2000 x (208 / 13200) = 31.5
Set for E Curve 65E

Project Name: SUNY-OSWEGO April 2013
TCC Name: 4C-007.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	4C-50/51	TCC Name:	4C-007.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	SEL		
Description:	50P/51P, 5A nom.		
Type:	751A	Class Desc:	SEL751A
AIC Rating:	N/A	Fault Duty:	3300.1A
Current Rating:	400A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR	3.1 (248A)	Test Points:	@2.0X, 6.353s
2) U4, Extremely Invers	3.3		@5.0X, 0.896s
			@10.0X, 0.305s

Device Name:	CB4C	TCC Name:	4C-007.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	3300.1A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-067	TCC Name:	4C-007.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	PD-0429	TCC Name:	4C-007.tcc
Bus Name:	4C.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	2923.4A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
FLA:	0.00A		
Setting:			

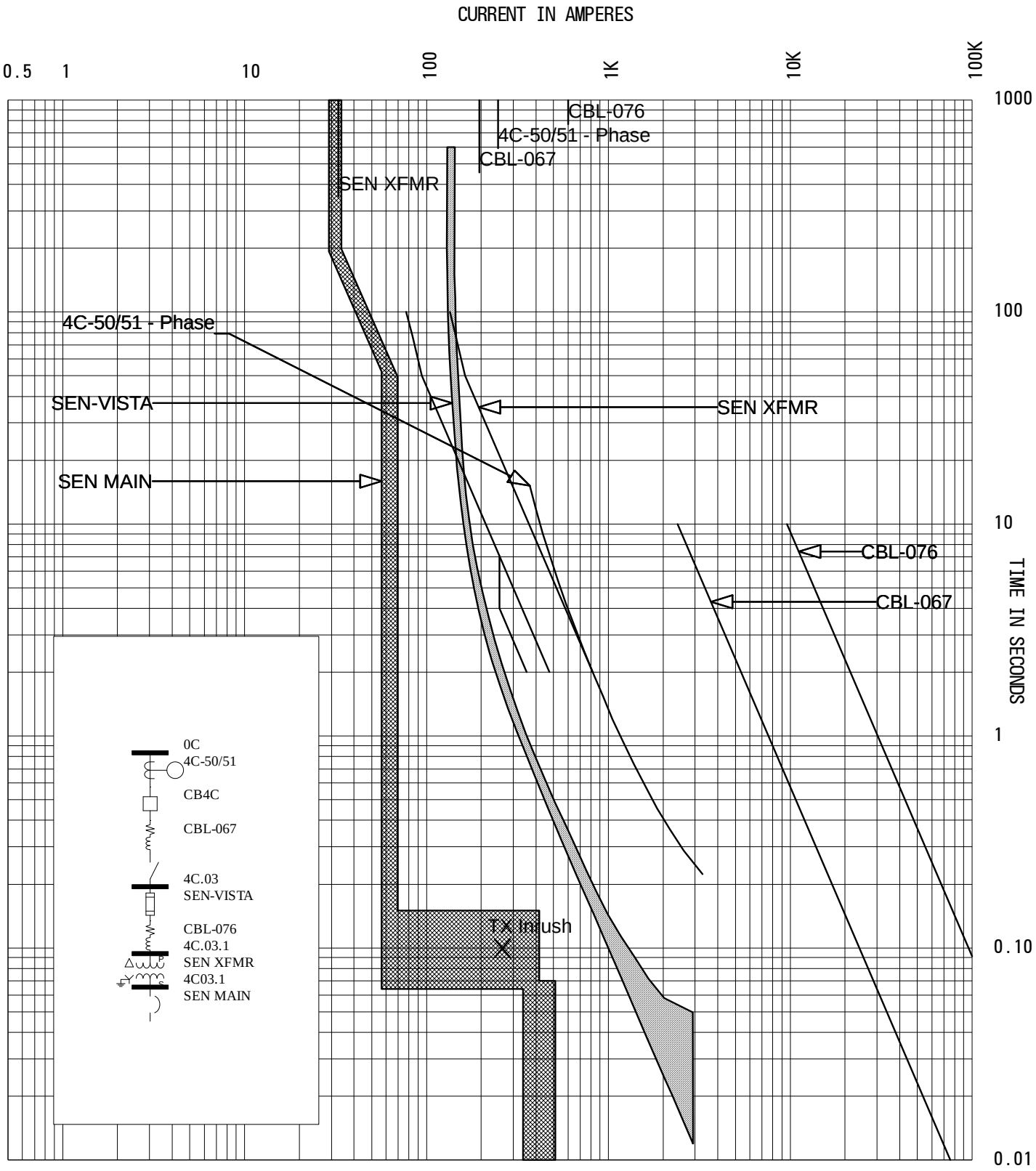
Device Name:	SEN-VISTA	TCC Name:	4C-007.tcc
Bus Name:	4C.03	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	S&C Vista		
Description:	E-Rated, Standard Speed		
Type:	Vista		
AIC Rating:	13kA	Fault Duty:	2923.4A
Cartridge:	Vista, 65E 15500V 65A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Size:	65A		

Device Name:	CBL-076	TCC Name:	4C-007.tcc
Bus Name:	4C.03	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	SEN XFMR	TCC Name:	4C-007.tcc
Bus Name:	4C.03.1	Bus Voltage:	13200.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/208 LL
Nominal Size:	750.0kVA		
Impedance (%Z):	5.3200	Pri Connection:	Delta
Inrush Factor:	8.0x	Sec Connection:	Wye-Ground

Device Name:	SEN MAIN	TCC Name:	4C-007.tcc
Bus Name:	4C03.1	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 200-5000A		
Type:	DS, RMS 510/610/810/910		
AIC Rating:	65kA ShortTime:65	Fault Duty:	32344.2A
Frame:	DS-4200 240V 2000A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	2000A		
Plug:	2000A		

Setting:			
1) LTPU (0.5-1.0 x P)	1	(2000A)	
2) LTD (2-24 Sec.)	7		
3) STPU (2-10 x LTPU)	2	(4000A)	
4) STD (0.1-0.5 Sec.)	0.1 Sec.	I^2 t Out	
5) INST (2-12 x P)	M2(12)	(24000A)	



TCC Name: 4C-007
Oneline: 4C-007 - Seneca
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
LOOP 5A FEEDER PHASE OVERCURRENT RELAY
5A-50/51

TCC: 004, 5A-001

Device: Multilin SR-750 Relay

Existing Settings: 1.25 AT, 4.0 TD Ext. Inverse, Inst OFF.

CT Ratio: 200:5

Feeder: 4/0 15 kV Cable rated at 295 amps

Pickup:
Set not more than 600% of the cable rating
Set not less than the upstream in line device
Set not less than 150% of the largest downstream device
225 x 1.5X = 337.5
Set for 1.7 AT (340 amps)

Delay:
Set to coordinate with upstream and downstream devices.
Set for not less than 0.3 seconds below the upstream device.
Set for not less than 0.15 seconds above the downstream device curve.
Set below the cable damage curve.
Set for 1.7 TD Very Inverse

Instantaneous:
OFF

Project Name: SUNY-OSWEGO April 2013(Base Project)
TCC Name: 5A-001.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	M2	TCC Name:	5A-001.tcc
Bus Name:	0.2.1	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2505.4A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	CBL-081	TCC Name:	5A-001.tcc
Bus Name:	0.2.2	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1200	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

Device Name:	Main A	TCC Name:	5A-001.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	600-3000A		
Type:	VCP-W		
AIC Rating:	18kA	Fault Duty:	2414.8A
Frame:	150 VCP-W-500 15000V 1200A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name: BUS A 50/51 TCC Name: 5A-001.tcc
Bus Name: 0A Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 2414.8A
Current Rating: 1200A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 0.43 (516A) Test Points: @2.0X, 3.838s
2) Ext Inverse 2.2 1 @5.0X, 0.544s
@10.0X, 0.216s

Device Name: 5A-50/51 TCC Name: 5A-001.tcc
Bus Name: 0A Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 2414.8A
Current Rating: 200A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 1.7 (340A) Test Points: @2.0X, 1.988s
2) Very Inverse 1.5 1 @5.0X, 0.390s
@10.0X, 0.218s

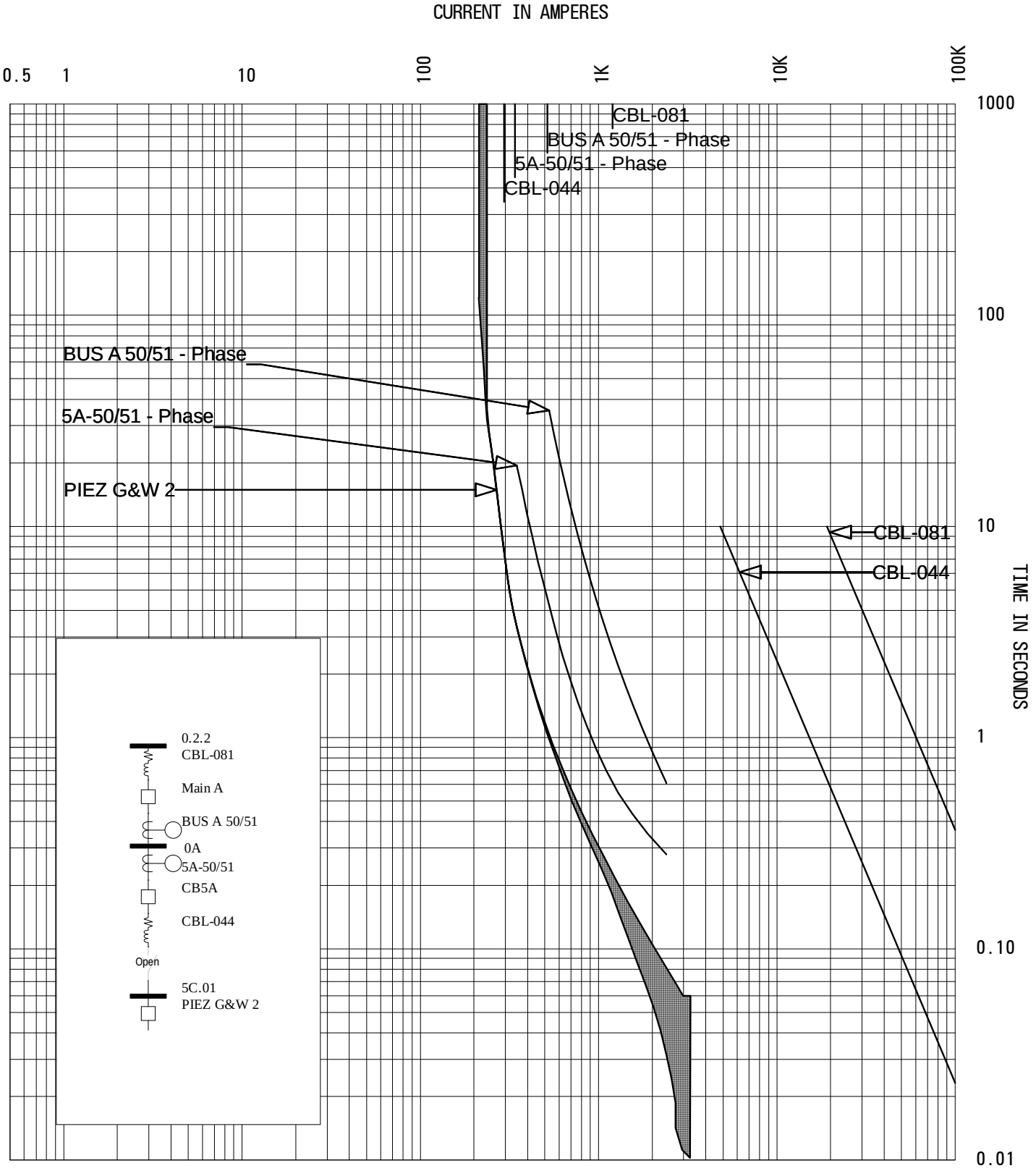
Device Name: CB5A TCC Name: 5A-001.tcc
Bus Name: 0A Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: CUTLER-HAMMER
Description: 600-3000A
Type: VCP-W
AIC Rating: 18kA Fault Duty: 2414.8A
Frame: 150 VCP-W-500 15000V 1200A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Sensor:
Plug:

Device Name:	PD-0306	TCC Name:	5A-001.tcc
Bus Name:	5C.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	3276.7A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	PIEZ G&W 2	TCC Name:	5A-001.tcc
Bus Name:	5C.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	G&W		
Description:	15-300A, 500:1 CT		
Type:	Type 2-3, E Speed Standard		
AIC Rating:	16kA	Fault Duty:	3276.7A
Frame:	500:1 15500V 600A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Setting: 1) Minimum Trip 225A (225A)
2) 0.0 Time Delay

Device Name:	CBL-044	TCC Name:	5A-001.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	4/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.



TCC Name: 5A-001
Oneline: 5A-001 - Feeder 5A
June 25, 2013 8:44 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
LOOP 5C FEEDER PHASE OVERCURRENT RELAY
5C-50/51

TCC: 006, 5C-001 – 003

Device: SEL-751

CT Ratio: 400:5

Existing Settings: None new device

Feeder: 1 per phase 4/0 MCM rated at 295 amps

Pickup (51P1P):
Set not more than 600% of feeder rating
Set not more than 67% of the upstream device
576 x 0.67 = 386
Set not less than 150% of the largest downstream device
225 x 1.5 = 337.5
Set for 4.3 AT (344A)

Delay (51P1C/51P1D):
Set under transformer damage curve
Set no less than 0.15 seconds above the downstream device
Set no less than 0.3 second below the upstream device
Set for 1.6 TD on the U3 Very Inverse Curve

Instantaneous (50P1P):
OFF

Project Name: SUNY-OSWEGO April 2013
TCC Name: 5C-001.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	BUS C 50/51			TCC Name:	5C-001.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A nom.				
Type:	351-0, -1, -2, -3, -4			Class Desc:	351-1
AIC Rating:	N/A			Fault Duty:	3300.1A
Current Rating:	600A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) 51PP		4.8	(576A)	Test Points:	@2.0X, 3.335s
2) U3, Very Inv		2.4			@5.0X, 0.619s
					@10.0X, 0.325s

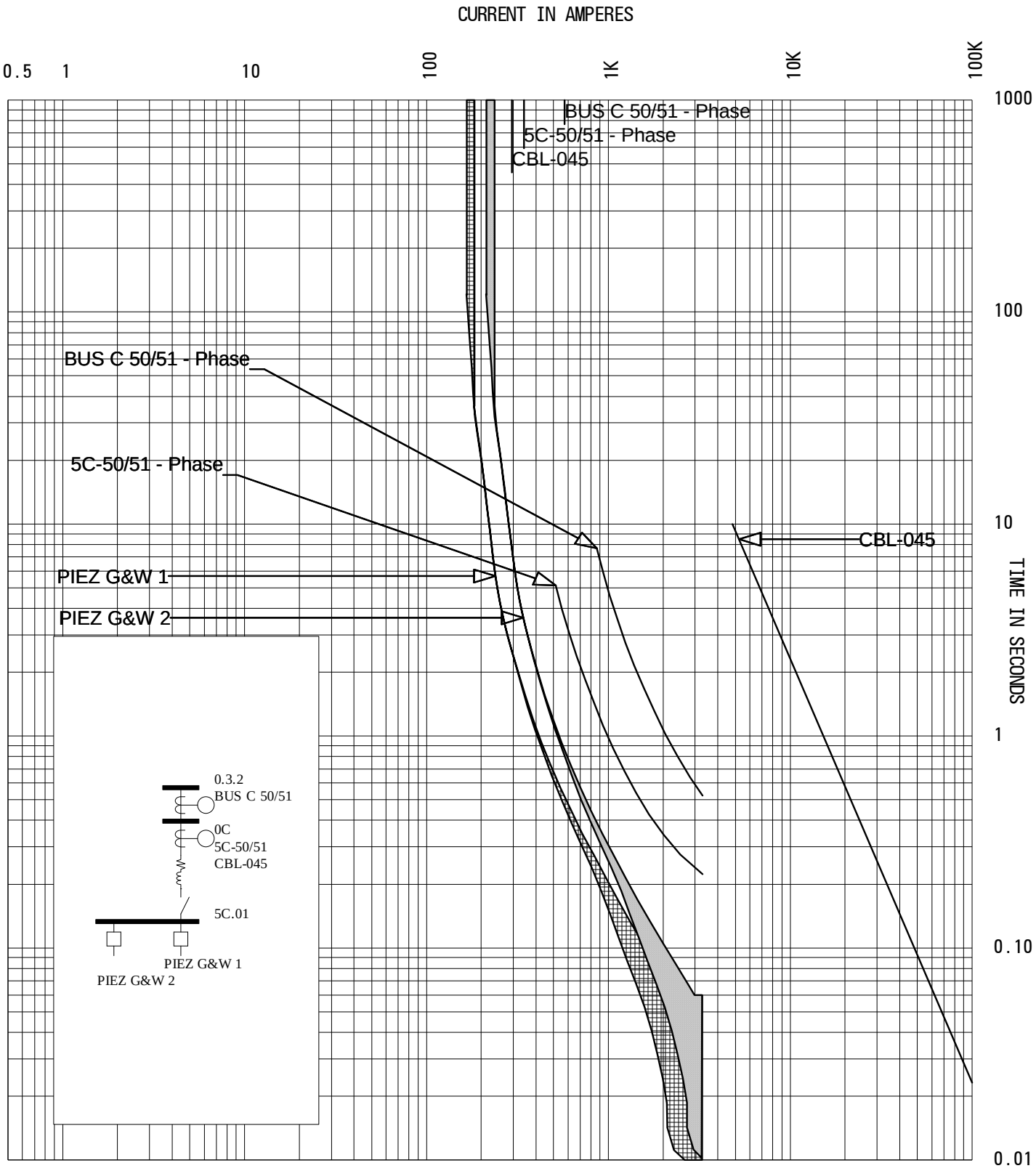
Device Name:	5C-50/51			TCC Name:	5C-001.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A nom.				
Type:	751A			Class Desc:	SEL751A
AIC Rating:	N/A			Fault Duty:	3300.1A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR		4.3	(344A)	Test Points:	@2.0X, 2.223s
2) U3, Very Inverse		1.6			@5.0X, 0.413s
					@10.0X, 0.217s

Device Name: PD-0307 TCC Name: 5C-001.tcc
Bus Name: 5C.01 Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer:
Description:
Type:
AIC Rating: 0kA Fault Duty: 3276.7A
Frame: Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Sensor:
Plug:

Device Name: PIEZ G&W 1 TCC Name: 5C-001.tcc
Bus Name: 5C.01 Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: G&W
Description: 15-300A, 500:1 CT
Type: Type 2-3, E Speed Standard
AIC Rating: 16kA Fault Duty: 3276.7A
Frame: 500:1 15500V 600A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Sensor:
Plug:
Setting: 1) Minimum Trip 175A (175A)
2) 0.0 Time Delay

Device Name: PIEZ G&W 2 TCC Name: 5C-001.tcc
Bus Name: 5C.01 Bus Voltage: 13200.0V
Function Name: Phase
Manufacturer: G&W
Description: 15-300A, 500:1 CT
Type: Type 2-3, E Speed Standard
AIC Rating: 16kA Fault Duty: 3276.7A
Frame: 500:1 15500V 600A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Sensor:
Plug:
Setting: 1) Minimum Trip 225A (225A)
2) 0.0 Time Delay

Device Name: CBL-045 TCC Name: 5C-001.tcc
Bus Name: 0C Bus Voltage: 13200.0V
Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Description: Cable Damage Curve Qty/Ph: 1
Size: 4/0 Cont. Temp: 90 deg C.
Material: Copper Damage Temp: 250 deg C.



TCC Name: 5C-001
Oneline: 5C-001 - Feeder 5C
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Piez Hall #1 Transformer Primary Overcurrent Device
PIEZ G&W 1

TCC:	5C-001, 5C-002
Existing Device:	G&W SF6 Switch
Existing Setting:	CO-8, 0.5 TD, 225A
Transformer:	1500 / 2000 kVA, 13.2kV Delta – 480Y/277V, 5.65 %Z 87.5 FLA @ 13.2kV, 2406 FLA @ 480V
Feeder:	1 set of 3 - #2 AWG MV-105, 15kV cable rated at 165A

<u>Fuse</u>
Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 87.5 x 3 = 262.4
Set not less than secondary main device 3000 x (480 / 13200) = 109.1
Set for E Speed Standard 175A

Project Name: SUNY-OSWEGO April 2013
TCC Name: 5C-002.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	BUS C 50/51			TCC Name:	5C-002.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A nom.				
Type:	351-0, -1, -2, -3, -4			Class Desc:	351-1
AIC Rating:	N/A			Fault Duty:	3300.1A
Current Rating:	600A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) 51PP		4.8	(576A)	Test Points:	@2.0X, 3.335s
2) U3, Very Inv		2.4			@5.0X, 0.619s
					@10.0X, 0.325s

Device Name:	5C-50/51			TCC Name:	5C-002.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A nom.				
Type:	751A			Class Desc:	SEL751A
AIC Rating:	N/A			Fault Duty:	3300.1A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) 51P1P, (0.5-16 x CTR		4.3	(344A)	Test Points:	@2.0X, 2.223s
2) U3, Very Inverse		1.6			@5.0X, 0.413s
					@10.0X, 0.217s

Device Name:	PD-0307	TCC Name:	5C-002.tcc
Bus Name:	5C.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	3276.7A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	PIEZ G&W 1	TCC Name:	5C-002.tcc
Bus Name:	5C.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	G&W		
Description:	15-300A, 500:1 CT		
Type:	Type 2-3, E Speed Standard		
AIC Rating:	16kA	Fault Duty:	3276.7A
Frame:	500:1 15500V 600A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Setting: 1) Minimum Trip 175A (175A)
2) 0.0 Time Delay

Device Name:	CBL-046	TCC Name:	5C-002.tcc
Bus Name:	5C.01	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	2	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

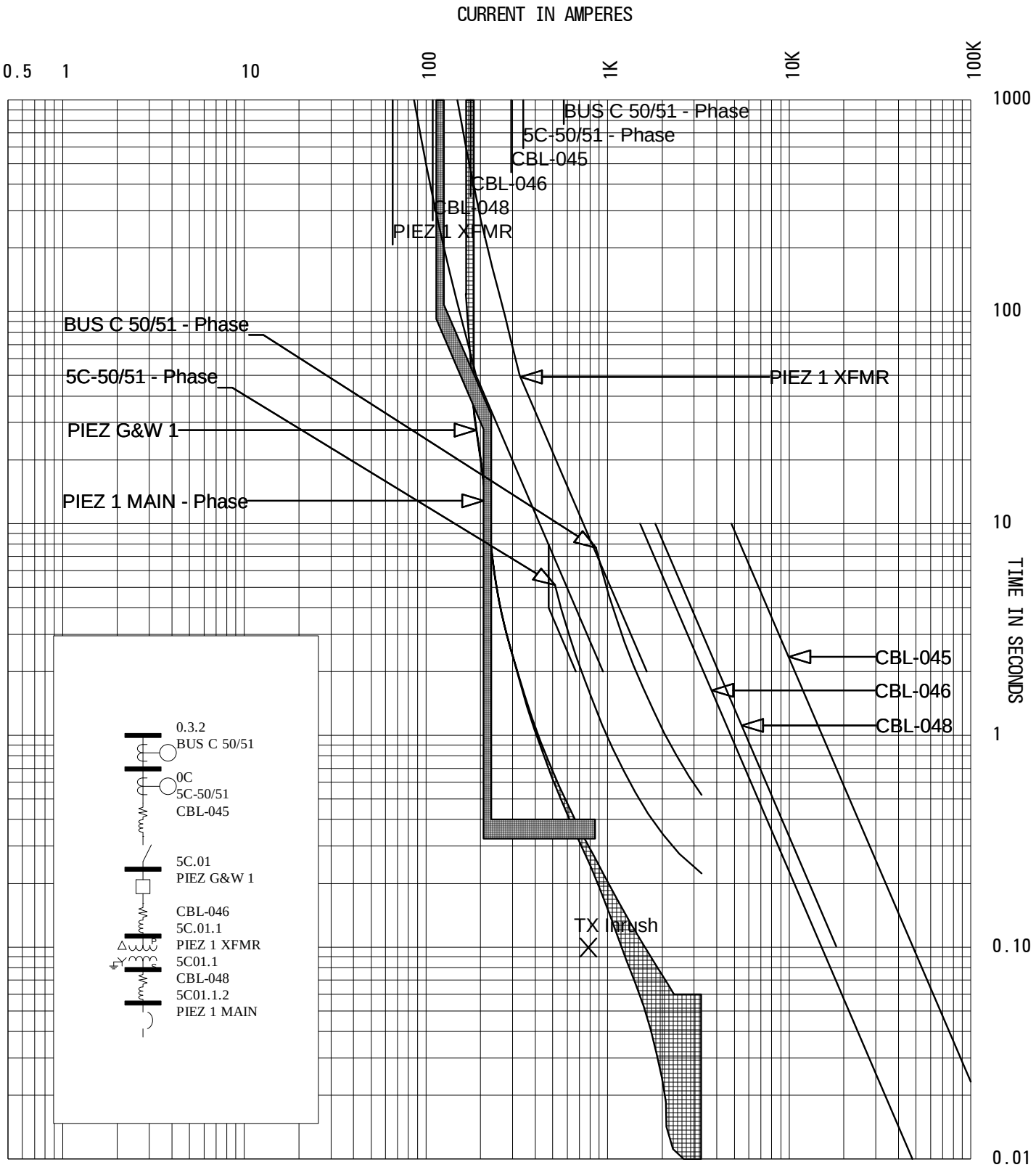
Device Name:	PIEZ 1 XFMR	TCC Name:	5C-002.tcc
Bus Name:	5C.01.1	Bus Voltage:	13200.0V / 480V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/480 LL
Nominal Size:	1500.0kVA		
Impedance (%Z):	5.6500	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	CBL-048	TCC Name:	5C-002.tcc
Bus Name:	5C01.1	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	3000	Cont. Temp:	75 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	PIEZ 1 MAIN	TCC Name:	5C-002.tcc
Bus Name:	5C01.1.2	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 3000AF, 200-3000AP		
Type:	Magnum SB, DT 520		
AIC Rating:	65kA ShortTime:50	Fault Duty:	23439.0A
Frame:	SBS-630 508V 3000A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	3000A		
Plug:	3000A		

Setting:			
1) LTPU, (0.4-1.0 x P)	1	(3000A)	
2) LTD, (2-24 Sec.)	4		
3) STPU, (2-10 x Ir)	2	(6000A)	
4) STD, (0.1-0.5 Sec.)	0.4	I^2 t Out	
5) INST, (2-14 x P)	10	(30000A)	
6) INST OR, (Fixed)	18 x In	(54000A)	

Device Name:	CBL-045	TCC Name:	5C-002.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	4/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.



TCC Name: 5C-002
Oneline: 5C-002 - Piez 1
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
Piez Hall #2 Transformer Primary Overcurrent Device
PIEZ G&W 2

TCC:	5C-001, 5C-003
Existing Device:	G&W SF6 Switch
Existing Setting:	CO8, 0.5 TD, 225A
Transformer:	2500 / 3333 kVA, 13.2kV Delta – 480Y/277V, 5.7 %Z 145.7 FLA @ 13.2kV, 4009 FLA @ 480V
Feeder:	1 set of 3 - 2/0 AWG MV-105, 15kV cable rated at 245A

Fuse
Set not more than 67% of the upstream device 248 x 0.67 = 166
Set not more than 300% transformer FLA 145.7 x 3 = 437
Set not less than secondary main device 4000 x (480 / 13200) = 145.5
Set for E Speed Standard 225A

Project Name: SUNY-OSWEGO April 2013
TCC Name: 5C-003.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	BUS C 50/51			TCC Name:	5C-003.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A nom.				
Type:	351-0, -1, -2, -3, -4			Class Desc:	351-1
AIC Rating:	N/A			Fault Duty:	3300.1A
Current Rating:	600A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51PP	4.8	(576A)	Test Points:	@2.0X, 3.335s
2)	U3, Very Inv	2.4			@5.0X, 0.619s
					@10.0X, 0.325s

Device Name:	5C-50/51			TCC Name:	5C-003.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A nom.				
Type:	751A			Class Desc:	SEL751A
AIC Rating:	N/A			Fault Duty:	3300.1A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51P1P, (0.5-16 x CTR	4.3	(344A)	Test Points:	@2.0X, 2.223s
2)	U3, Very Inverse	1.6			@5.0X, 0.413s
					@10.0X, 0.217s

Device Name:	PD-0307	TCC Name:	5C-003.tcc
Bus Name:	5C.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:			
Description:			
Type:			
AIC Rating:	0kA	Fault Duty:	3276.7A
Frame:		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Device Name:	PIEZ G&W 2	TCC Name:	5C-003.tcc
Bus Name:	5C.01	Bus Voltage:	13200.0V
Function Name:	Phase		
Manufacturer:	G&W		
Description:	15-300A, 500:1 CT		
Type:	Type 2-3, E Speed Standard		
AIC Rating:	16kA	Fault Duty:	3276.7A
Frame:	500:1 15500V 600A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:			
Plug:			

Setting: 1) Minimum Trip 225A (225A)
2) 0.0 Time Delay

Device Name:	CBL-047	TCC Name:	5C-003.tcc
Bus Name:	5C.01	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	2/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

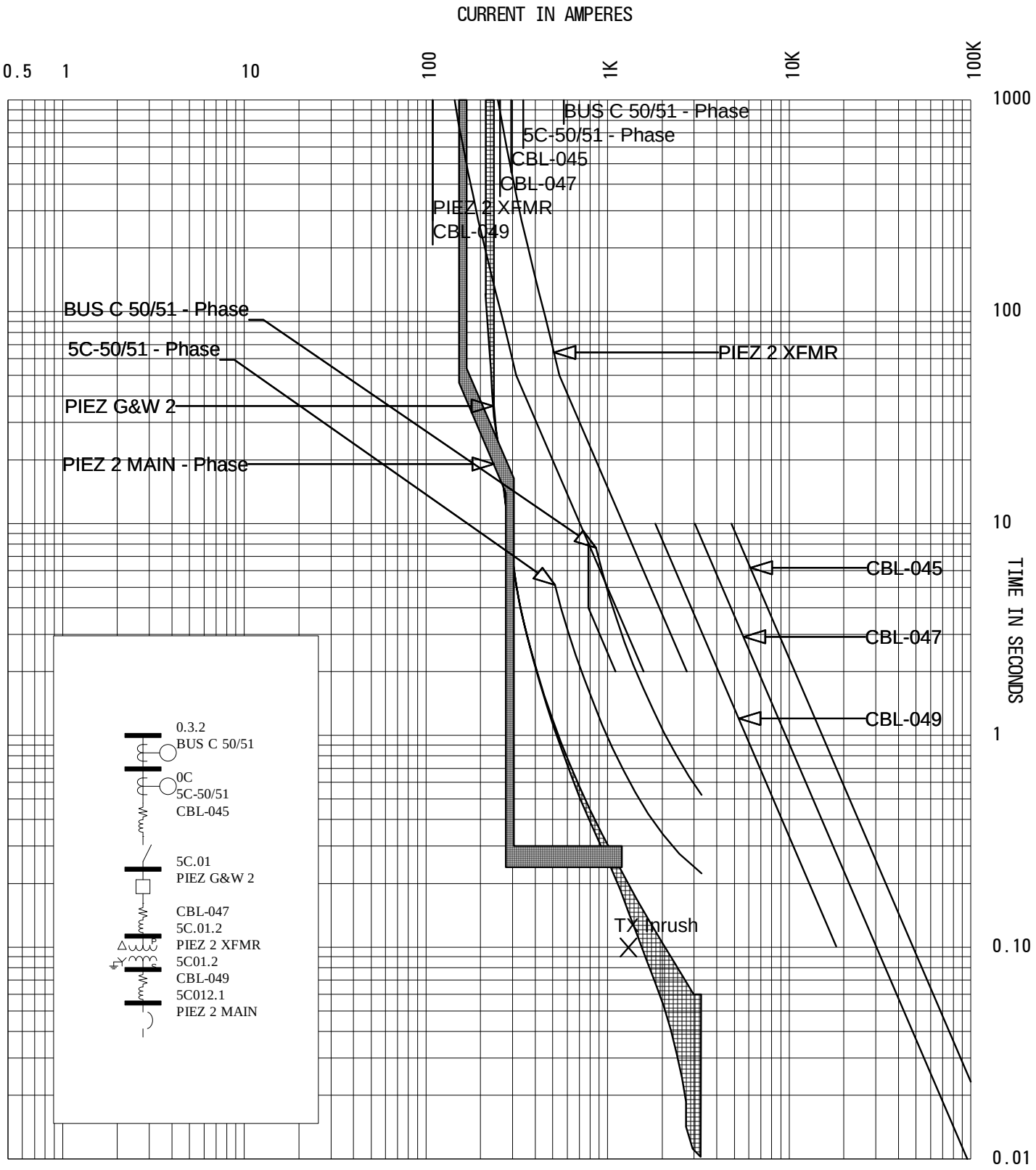
Device Name:	PIEZ 2 XFMR	TCC Name:	5C-003.tcc
Bus Name:	5C.01.2	Bus Voltage:	13200.0V / 480V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	13200 LL/480 LL
Nominal Size:	2500.0kVA		
Impedance (%Z):	5.7000	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

Device Name:	CBL-049	TCC Name:	5C-003.tcc
Bus Name:	5C01.2	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	3000	Cont. Temp:	75 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	PIEZ 2 MAIN	TCC Name:	5C-003.tcc
Bus Name:	5C012.1	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	LSI, 5000A DWF, 2500-5000AP		
Type:	Magnum SB, DT 520		
AIC Rating:	100kA ShortTime:100	Fault Duty:	33031.5A
Frame:	SBS-C50 508V 5000A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Sensor:	5000A		
Plug:	5000A		

Setting: 1)	Ir, (0.4-1.0 x P)	0.8	(4000A)
2)	LTD, (2-24 Sec.)	2	
3)	STPU, (2-10 x Ir)	2	(8000A)
4)	STD, (0.1-0.5 Sec.)	0.3	I^2 t Out
5)	INST, (2-14 x P)	3000-5000A M1 (60000A)	

Device Name:	CBL-045	TCC Name:	5C-003.tcc
Bus Name:	0C	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	4/0	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.



TCC Name: 5C-003
Oneline: 5C-003 - Piez 2
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
TRANSFORMER 3 PRIMARY PHASE OVERCURRENT DEVICE
T3-P-50/51

TCC:	005
Device:	GE Multilin SR760
CT Ratio:	400:4 (device uses primary ratio to determine settings)
Existing Settings:	0.6X, 4.7 TD Extr Inv Curve, 5.7X Inst
Transformer	7500/10500 kVA 7.46% Z 176 FLA @ 34.5kV, 460 FLA @ 13.2kV, 1255A Inrush @ 0.1 Seconds

Pickup:
Set no more than 400% of primary FLA
Set not more than 67% of the upstream device
600 x 0.67 = 402A
Set not less than secondary device
The existing setting is satisfactory
Set for 0.6 X (240A)

Delay:
Set under transformer damage curve
Set no less than 0.3 seconds above the downstream device
Set for 2.8 TD on the Normal Inverse Curve

Instantaneous:
Set to ride through transformer inrush of 1255A
Set for 170% of secondary fault
((3471 x 1.7) x (13.2 / 34.5) = 2258A
Set for 5.7X (2280A)

SUNY OSWEGO – 13.2kV SYSTEM STUDY
TRANSFORMER 3 BACKUP PRIMARY PHASE OVERCURRENT DEVICE
T3-P-50/51-BU

TCC:	005
Device:	SEL-501
CT Ratio:	400:4 (80:1)
Existing Settings:	3.0AT, 4.3TD U4 Curve, 28.5 Inst
Transformer	7500/10500 kVA 7.46% Z 176 FLA @ 34.5kV, 460 FLA @ 13.2kV, 1255A Inrush @ 0.1 Seconds

Pickup (51PP):
Set no more than 400% of primary FLA
Set not less than secondary device
Set for 3AT (240A)

Delay (51PC/51PTD):
Set under transformer damage curve
Set no less than 0.3 seconds above the downstream device
Set for 2.7 TD on the U2 Inverse Curve

Instantaneous (50P1P):
Set to ride through transformer inrush of 1255A
Set for 170% of secondary fault
((3471 x 1.7) x (13.2 / 34.5) = 2258A
Set for 28.5 Relay Amps (2280A)

SUNY OSWEGO – 13.2kV SYSTEM STUDY
TRANSFORMER 3 SECONDARY PHASE OVERCURRENT DEVICE
T3-50/51

TCC:	005, 006
Device:	SEL-551
CT Ratio:	1200:5 MR Tap at 600:5 (120:1)
Existing Settings:	None new device
Transformer	7500/10500 kVA 7.46% Z 176 FLA @ 34.5kV, 460 FLA @ 13.2kV, 1255A Inrush @ 0.1 Seconds

Pickup (51P1P):
Set no more than 250% of secondary FLA
Set not more than primary device 240 x (34.5/13.2) = 627.3A
Set not less than the downstream device
Set for 4.8AT (576A)

Delay (51P1C/51P1D):
Set under transformer damage curve
Set no less than 0.3 seconds above the downstream device
Set no less than 0.3 second below the upstream device
Set for 2.1 TD on the U2 Inverse Curve

Instantaneous (50P1P):
OFF

SUNY OSWEGO – 13.2kV SYSTEM STUDY
T3 Transformer Differential Relay
T3-87

Existing Device:	SEL-387 Solid State Multifunction Relay
Existing Settings:	Primary Tap 2.20 AT, Secondary Tap 3.83 AT, Restraining Element 0.3 Slope 1 30%, Slope 2 OFF, IRS1 N/A, Unrestrained Element 9X
CT Ratios:	400:5 (80:1) Wye connected – Primary 1200:5 MR Tapped at 600:5 (120:1) Wye connected – Secondary
Transformer:	7.5/10.5 MVA 46kV Delta Primary – 13.2kV Wye Secondary, 7.46%Z 175.7 FLA at 34.5kV, 459.3 FLA at 13.2kV, 1255.1 Inrush at 10X

<u>87T Taps</u>

Tap 1 (Primary)	175.5 FLA / 80 CT = 2.19 amps **Set for 2.20 amps (Wye connected)**
Tap 2 (Secondary)	459.3 FLA / 120 CT = 3.83 amps **Set for 3.83 amps (Wye connected)**

<u>Restraining element (O87P)</u>
Set equal to or greater than (0.1 x relay In/Tap min)
(0.1 x 5)/2.2 = 0.227
Set for 0.3

<u>Slope 1:</u>
Transformer is equipped with an NLTC with a +/- 5% of Nominal
Transformer is equipped with an LTC with a +/- 10% of Nominal
Worst case with NLTC at top and LTC at bottom tap = 15%
Set equal or greater than 200% worst case difference
SLP1: Set for 30% Slope

<u>Slope 2:</u>
This slope is not needed
SLP2: Turn off

<u>IRS1 Setting</u>
This setting is not available with SLP2 turned off
IRS1: N/A

<u>Unrestrained Element (U87P):</u>
Set lower than (31 x In)/Tap max
(31 x 5)/3.8 = 40.8 This is the maximum that the relay is capable of withstanding
Set above Inrush
1255 amps inrush / 80 CT = 15.7 amps
15.7 / 3.8 = 4.13 X tap
Use 2X safety factor 4.13 x 2 = 8.26
Set for 9X Tap

Project Name: SUNY-OSWEGO April 2013
TCC Name: 005.tcc
Reference Voltage: 34500 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	NMPC 50/51			TCC Name:	005.tcc
Bus Name:	0.000			Bus Voltage:	34500.0V
Function Name:	Phase				
Manufacturer:	WESTINGHOUSE				
Description:	50/51				
Type:	CO-6			Class Desc:	CO-6
AIC Rating:	N/A			Fault Duty:	6303.0A
Current Rating:	500A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) Tap		6.0	(600A)	Test Points:	@2.0X, 1.663s
2) Time Dials		3.9			@5.0X, 0.952s
3) INST (High)		40	(4000A)		@10.0X, 0.852s

Device Name:	T3 P-50/51			TCC Name:	005.tcc
Bus Name:	0.000			Bus Voltage:	34500.0V
Function Name:	Phase				
Manufacturer:	MULTILIN				
Description:	5A CT Sec				
Type:	SR750/760 Feeder Relay			Class Desc:	SR760
AIC Rating:	N/A			Fault Duty:	6303.0A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) OC Pickup		0.6	(240A)	Test Points:	@2.0X, 4.944s
2) Norm Inverse		2.8	1		@5.0X, 1.139s
3) Inst OC Pickup		5.7	(2280A)		@10.0X, 0.633s

Device Name:	T3 P-50/51 BU			TCC Name:	005.tcc
Bus Name:	0.000			Bus Voltage:	34500.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A Rated				
Type:	501-2			Class Desc:	
AIC Rating:	N/A			Fault Duty:	6303.0A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51PP	3	(240A)	Test Points:	@2.0X, 5.841s
2)	U2, Inverse	2.7			@5.0X, 1.155s
3)	50PP	28.5	(2280A)		

Device Name:	T3	TCC Name:	005.tcc
Bus Name:	0.03	Bus Voltage:	34500.0V / 13200V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	34500 LL/13200 LL
Nominal Size:	7500.0kVA		
Impedance (%Z):	7.4600	Pri Connection:	Delta
Inrush Factor:	10.0x	Sec Connection:	Wye-Ground

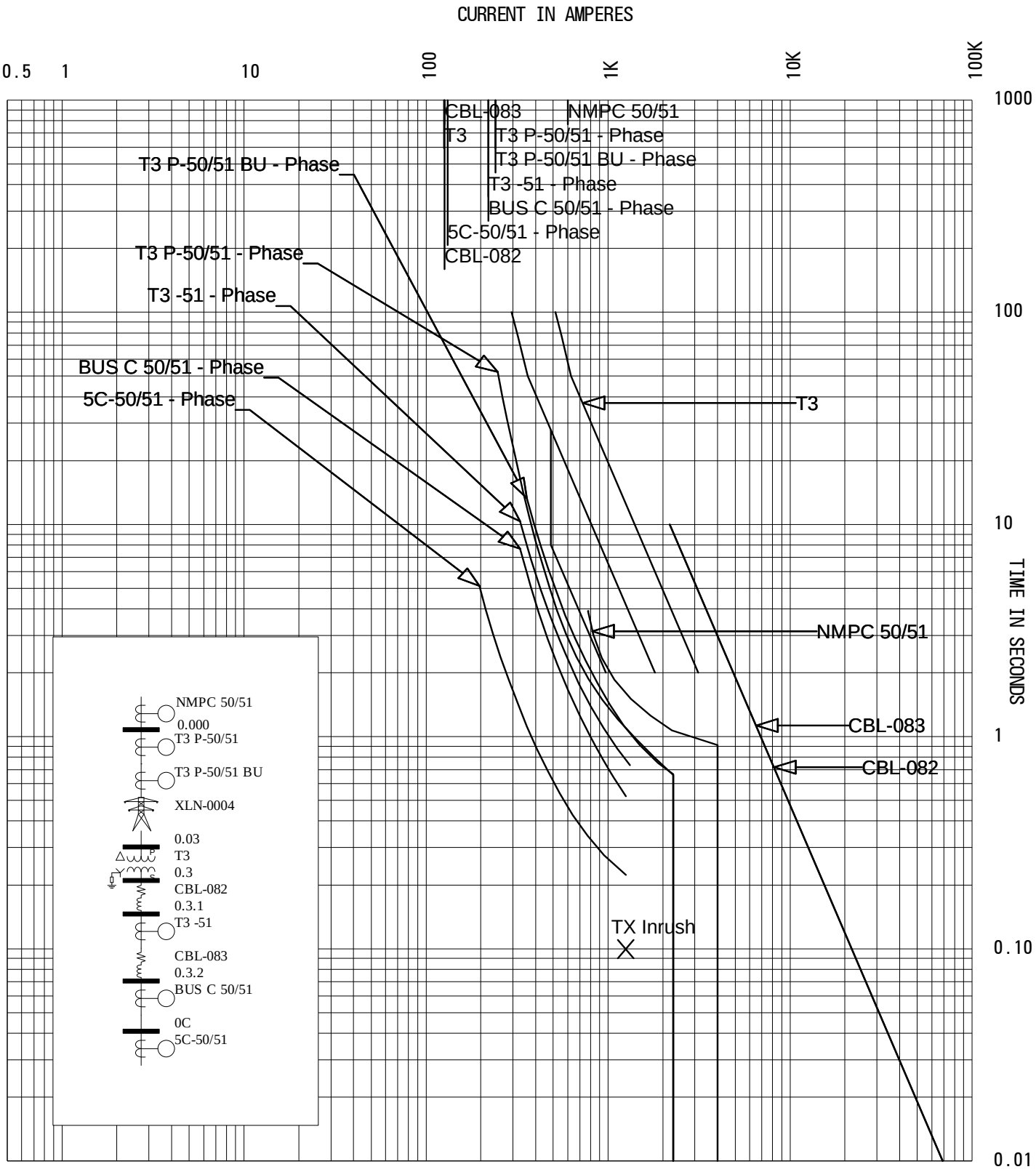
Device Name:	CBL-082	TCC Name:	005.tcc
Bus Name:	0.3	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	250	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	T3 -51			TCC Name:	005.tcc
Bus Name:	0.3.1			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A Rated				
Type:	551			Class Desc:	
AIC Rating:	N/A			Fault Duty:	3469.5A
Current Rating:	600A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51P1P/51P2P	4.8	(576A)	Test Points:	@2.0X, 4.543s
2)	U2, Inverse	2.1			@5.0X, 0.899s
					@10.0X, 0.504s

Device Name:	CBL-083	TCC Name:	005.tcc
Bus Name:	0.3.1	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	250	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	BUS C 50/51			TCC Name:	005.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A nom.				
Type:	351-0, -1, -2, -3, -4			Class Desc:	351-1
AIC Rating:	N/A			Fault Duty:	3300.1A
Current Rating:	600A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51PP	4.8	(576A)	Test Points:	@2.0X, 3.335s
2)	U3, Very Inv	2.4			@5.0X, 0.619s
					@10.0X, 0.325s

Device Name:	5C-50/51			TCC Name:	005.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A nom.				
Type:	751A			Class Desc:	SEL751A
AIC Rating:	N/A			Fault Duty:	3300.1A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51P1P, (0.5-16 x CTR	4.3	(344A)	Test Points:	@2.0X, 2.223s
2)	U3, Very Inverse	1.6			@5.0X, 0.413s
					@10.0X, 0.217s



TCC Name: 005
Oneline: 005 - Transformer T3
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 34500
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
BUS C MAIN PHASE OVERCURRENT RELAY
BUS C-50/51

TCC:	005, 006, 2C-001, 3C-001, 4C-001, 5C-001 – 003
Device:	SEL-351
CT Ratio:	1200:5MR Tapped at 1200:5 **Tap for 600:5**
Existing Settings:	None new device
Feeder:	2 per phase 250 MCM rated at 520 amps

Pickup (51P1P):
Set not more than 600% of feeder rating
Set not more than the upstream device
Set not less than 150 of the largest downstream device
344 x 1.5 = 516A
Set for 4.8 AT (576A)

Delay (51P1C/51P1D):
Set under transformer damage curve
Set no less than 0.3 seconds above the downstream device
Set no less than 0.3 second below the upstream device
Set for 2.4 TD on the U3 Very Inverse Curve

Instantaneous (50P1P):
OFF

Project Name: SUNY-OSWEGO April 2013
TCC Name: 006.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	T3 -51			TCC Name:	006.tcc
Bus Name:	0.3.1			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A Rated				
Type:	551			Class Desc:	
AIC Rating:	N/A			Fault Duty:	3469.5A
Current Rating:	600A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51P1P/51P2P	4.8	(576A)	Test Points:	@2.0X, 4.543s
2)	U2, Inverse	2.1			@5.0X, 0.899s
					@10.0X, 0.504s

Device Name:	CBL-083	TCC Name:	006.tcc
Bus Name:	0.3.1	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	250	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	CBL-084	TCC Name:	006.tcc
Bus Name:	0.3.2	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	1200	Cont. Temp:	65 deg C.
Material:	Copper	Damage Temp:	130 deg C.

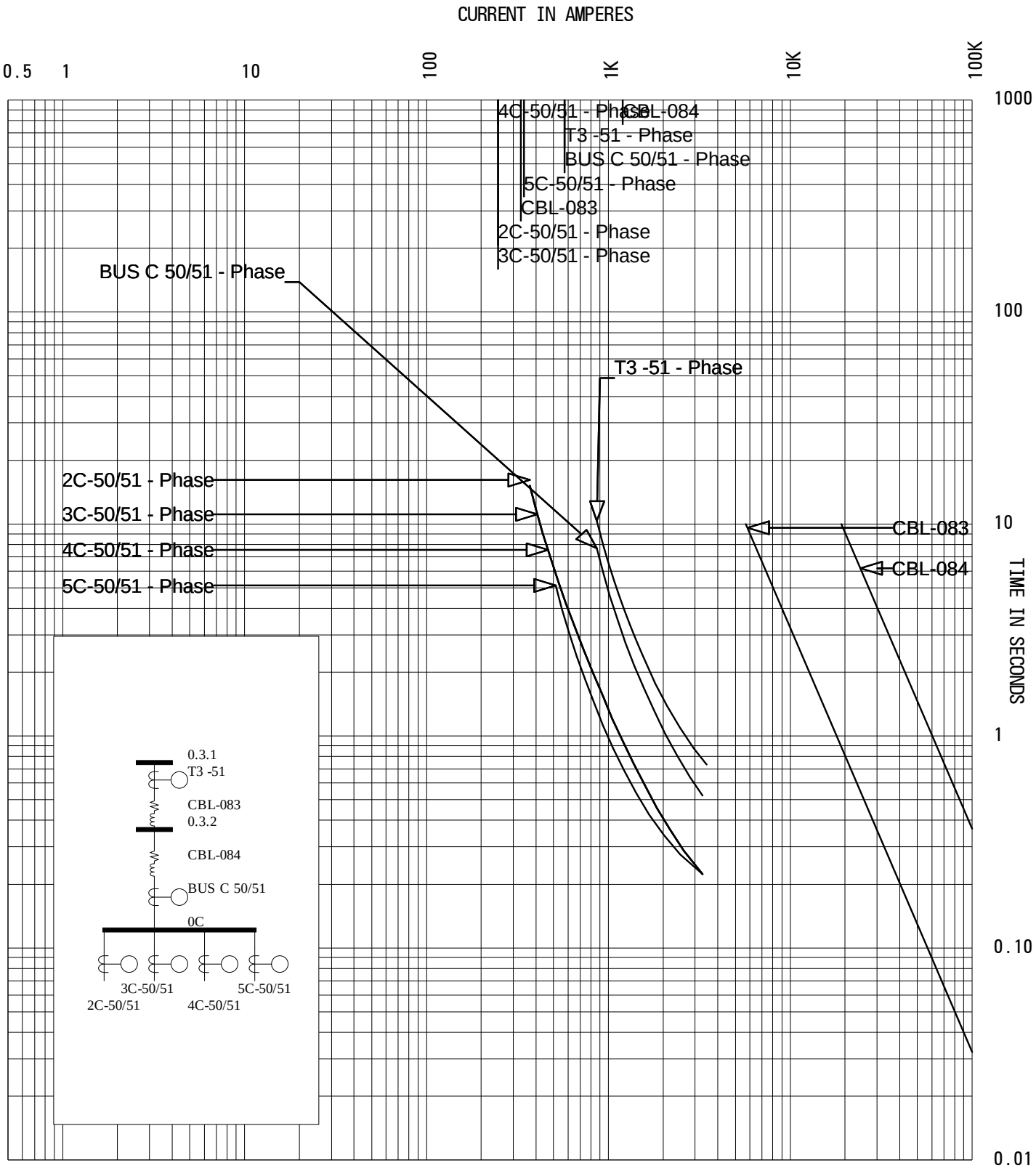
Device Name:	BUS C 50/51			TCC Name:	006.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A nom.				
Type:	351-0, -1, -2, -3, -4			Class Desc:	351-1
AIC Rating:	N/A			Fault Duty:	3300.1A
Current Rating:	600A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51PP	4.8	(576A)	Test Points:	@2.0X, 3.335s
2)	U3, Very Inv	2.4			@5.0X, 0.619s
					@10.0X, 0.325s

Device Name:	2C-50/51			TCC Name:	006.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A nom.				
Type:	751A			Class Desc:	SEL751A
AIC Rating:	N/A			Fault Duty:	3300.1A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51P1P, (0.5-16 x CTR	3.1	(248A)	Test Points:	@2.0X, 6.353s
2)	U4, Extremely Invers	3.3			@5.0X, 0.896s
					@10.0X, 0.305s

Device Name:	3C-50/51			TCC Name:	006.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A nom.				
Type:	751A			Class Desc:	SEL751A
AIC Rating:	N/A			Fault Duty:	3300.1A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51P1P, (0.5-16 x CTR	3.1	(248A)	Test Points:	@2.0X, 6.353s
2)	U4, Extremely Invers	3.3			@5.0X, 0.896s
					@10.0X, 0.305s

Device Name:	4C-50/51			TCC Name:	006.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A nom.				
Type:	751A			Class Desc:	SEL751A
AIC Rating:	N/A			Fault Duty:	3300.1A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51P1P, (0.5-16 x CTR	3.1	(248A)	Test Points:	@2.0X, 6.353s
2)	U4, Extremely Invers	3.3			@5.0X, 0.896s
					@10.0X, 0.305s

Device Name:	5C-50/51			TCC Name:	006.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	Phase				
Manufacturer:	SEL				
Description:	50P/51P, 5A nom.				
Type:	751A			Class Desc:	SEL751A
AIC Rating:	N/A			Fault Duty:	3300.1A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51P1P, (0.5-16 x CTR	4.3	(344A)	Test Points:	@2.0X, 2.223s
2)	U3, Very Inverse	1.6			@5.0X, 0.413s
					@10.0X, 0.217s



TCC Name: 006
Oneline: 006 - 13.2kV Bus C
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
TRANSFORMER 1 PRIMARY GROUND FAULT DEVICE
T1-P-50/51-GF (T2-P-50/51-GF Typical)

TCC: 001G

Device: Multilin SR-745 Relay

Existing Settings: 0.3X, 0.5 TD Mod. Inverse, Inst 3X

CT Ratio: 1200:5 MR tapped at 400:5
Note: This relay uses CT primary amps to calculate tap settings.

Transformer: 5000/6250 kVA, 7.4% Z
104.6 FLA @ 34.5kV, 273.4 FLA @ 13.2kV, 669.4 A Inrush at 0.1 sec

Pickup:
Set not more than 67% Phase setting
Set not less than 10% of the CT rating
Set not more than 67% of upstream device
400 x 0.67 = 268 amps
Existing setting is satisfactory
Set for 0.2 (80A)

Delay:
Set not less than 0.4 seconds under the upstream Electro-Mechanical device
Set to ride through transients
Existing setting is satisfactory
Set for 1.0 TD on the Moderate Inverse Curve

Instantaneous:
Set to ride through the transformer inrush,
Set for 4X (1600A)

Note:
This device does not coordinate with the upstream device for faults 2250A and greater.

SUNY OSWEGO – 13.2kV SYSTEM STUDY
TRANSFORMER 1 BACKUP GROUND FAULT DEVICE
T1-P-50/51- BU - GF (T2-P-50/51- BU - GF Typical)

TCC: 001G

Device: Multilin SR-735 Relay

Existing Settings: 0.3X, 0.5 TD Mod. Inverse, Inst 4X.

CT Ratio: 1200:5 MR tapped at 1200:5
Note: This relay uses CT primary amps to calculate tap settings.

Transformer: 5000/6250 kVA, 7.4% Z
104.6 FLA @ 34.5kV, 273.4 FLA @ 13.2kV, 669.4 A Inrush at 0.1 sec

Pickup:
Set to match main device
Set for 20% (80A)

Delay:
Set to match the main device
Set for 1.0 TD on the Moderate Inverse Curve (1.0X Multiplier)

Instantaneous:
Set to match the main device, as possible
Set for 4.0X (1600A)

Note:
This device does not coordinate with the upstream device for faults 2250A and greater.

SUNY OSWEGO – 13.2kV SYSTEM STUDY
TRANSFORMER 3 PRIMARY GROUND FAULT DEVICE
T3-P-50/51GF

TCC:	001G
Device:	GE Multilin SR760
CT Ratio:	400:4 (device uses primary ratio to determine settings)
Existing Settings:	0.1X, 1.2TD Mod Inverse Curve, 3.5X Inst
Transformer	7500/10500 kVA 7.46% Z 176 FLA @ 34.5kV, 460 FLA @ 13.2kV, 1255A Inrush @ 0.1 Seconds

Pickup:
Set no less than 10% of primary FLA 176 x 0.1 = 17.6A
Set not more than 67% of the phase setting
Set for 0.2 X (80A)

Delay:
Set under transformer damage curve
Set no less than 0.3 seconds below the upstream device
Set to ride through transients of 0.1 seconds
Set for 1.0 TD on the Moderately Inverse Curve

Instantaneous:
Set to ride through transformer inrush of 1255A
Set to ride thru transients
Set for 4X (1600A)

SUNY OSWEGO – 13.2kV SYSTEM STUDY
TRANSFORMER 3 BACKUP GROUND FAULT DEVICE
T3-P-50/51-BU-GF

TCC:	001G
Device:	SEL-501
CT Ratio:	400:4 (80:1)
Existing Settings:	None new device
Transformer	7500/10500 kVA 7.46% Z 176 FLA @ 34.5kV, 460 FLA @ 13.2kV, 1255A Inrush @ 0.1 Seconds

Pickup (51NP):
Set no less than 10% of primary FLA 176 x 0.1 = 17.6A
Set not more than 67% of the phase setting
Set for 1.0 X (80A)

Delay (51NC/51NTD):
Set under transformer damage curve
Set no less than 0.3 seconds below the upstream device
Set to ride through transients of 0.1 seconds
Set for 1.0 TD on the U1 Moderately Inverse Curve

Instantaneous (50NP):
Set to ride through transformer inrush of 1255A
Set to ride thru transients
Set for 20 Relay Amps (1600A)

Project Name: SUNY-OSWEGO April 2013
TCC Name: 001G.tcc
Reference Voltage: 34500 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	T1 P-50/51 BU			TCC Name:	001G.tcc
Bus Name:	0.000			Bus Voltage:	34500.0V
Function Name:	GF				
Manufacturer:	MULTILIN				
Description:	GF, 5A CT Sec				
Type:	SR735/737 Feeder Relay			Class Desc:	SR737
AIC Rating:	N/A			Fault Duty:	6303.0A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) Pickup(Lo)		20 %	(80A)	Test Points:	@2.0X, 0.757s
2) MOD INV		1	1		@5.0X, 0.332s
3) INST		4.0	(1600A)		@10.0X, 0.247s

Device Name:	NMPC 50/51G			TCC Name:	001G.tcc
Bus Name:	0.000			Bus Voltage:	34500.0V
Function Name:	Phase				
Manufacturer:	WESTINGHOUSE				
Description:	50/51				
Type:	CO-6			Class Desc:	CO-6
AIC Rating:	N/A			Fault Duty:	6303.0A
Current Rating:	500A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) Tap		4.0	(400A)	Test Points:	@2.0X, 1.441s
2) Time Dials		3.3			@5.0X, 0.817s
3) INST (High)		22.5	(2250A)		@10.0X, 0.744s

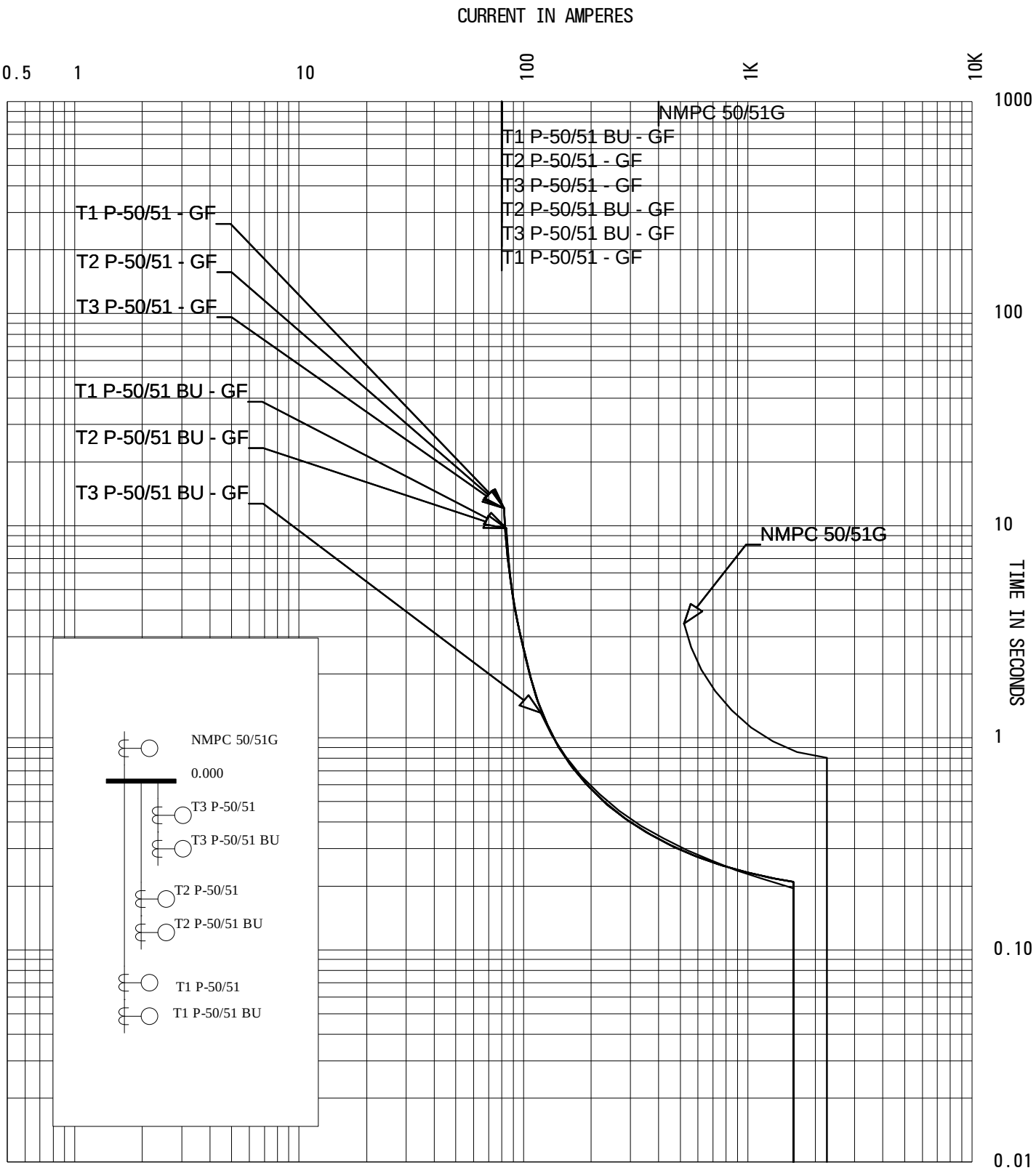
Device Name:	T2 P-50/51			TCC Name:	001G.tcc
Bus Name:	0.000			Bus Voltage:	34500.0V
Function Name:	GF				
Manufacturer:	MULTILIN				
Description:	5A CT Sec				
Type:	SR745 Xfmr Relay			Class Desc:	SR745
AIC Rating:	N/A			Fault Duty:	6303.0A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) OC Pickup		0.2	(80A)	Test Points:	@2.0X, 0.757s
2) Mod Inverse		1	1		@5.0X, 0.332s
3) Inst OC Pickup		4	(1600A)		@10.0X, 0.247s

Device Name:	T3 P-50/51			TCC Name:	001G.tcc
Bus Name:	0.000			Bus Voltage:	34500.0V
Function Name:	GF				
Manufacturer:	MULTILIN				
Description:	5A CT Sec				
Type:	SR750/760 Feeder Relay			Class Desc:	SR760
AIC Rating:	N/A			Fault Duty:	6303.0A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) OC Pickup		0.2	(80A)	Test Points:	@2.0X, 0.757s
2) Mod Inverse		1	1		@5.0X, 0.332s
3) Inst OC Pickup		4	(1600A)		@10.0X, 0.247s

Device Name:	T2 P-50/51 BU			TCC Name:	001G.tcc
Bus Name:	0.000			Bus Voltage:	34500.0V
Function Name:	GF				
Manufacturer:	MULTILIN				
Description:	GF, 5A CT Sec				
Type:	SR735/737 Feeder Relay			Class Desc:	SR737
AIC Rating:	N/A			Fault Duty:	6303.0A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1) Pickup(Lo)		20 %	(80A)	Test Points:	@2.0X, 0.757s
2) MOD INV		1	1		@5.0X, 0.332s
3) INST		4.0	(1600A)		@10.0X, 0.247s

Device Name:	T3 P-50/51 BU			TCC Name:	001G.tcc
Bus Name:	0.000			Bus Voltage:	34500.0V
Function Name:	GF				
Manufacturer:	SEL				
Description:	50G/51G, 5A Rated				
Type:	551			Class Desc:	
AIC Rating:	N/A			Fault Duty:	6303.0A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51G1P	1	(80A)	Test Points:	@2.0X, 0.772s
2)	U1, Mod Inv	1			@5.0X, 0.345s
3)	50G1P/50G2P	20	(1600A)		@10.0X, 0.247s

Device Name:	T1 P-50/51			TCC Name:	001G.tcc
Bus Name:	0.000			Bus Voltage:	34500.0V
Function Name:	GF				
Manufacturer:	MULTILIN				
Description:	5A CT Sec				
Type:	SR745 Xfmr Relay			Class Desc:	SR745
AIC Rating:	N/A			Fault Duty:	6303.0A
Current Rating:	400A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	OC Pickup	0.2	(80A)	Test Points:	@2.0X, 0.757s
2)	Mod Inverse	1	1		@5.0X, 0.332s
3)	Inst OC Pickup	4	(1600A)		@10.0X, 0.247s



TCC Name: 001G
Oneline: 001G - 34.5kV Ground Fault
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 34500
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY
TRANSFORMER 1 SECONDARY GROUND FAULT DEVICE
T1-50/51-GF (T2-50/51-GF Typical)

TCC:	002G
Device:	Multilin SR-760 Relay
Existing Settings:	0.35 AT, 7.0 TD Ext. Inverse, Inst OFF.
CT Ratio:	200:5 *Note: This relay uses CT primary amps to calculate tap settings.*
NGR:	400A @ 10 Seconds

Pickup:
Set not more than 20% of rating
Set not less than 150% of downstream feeder device
Set for 0.4 (80A)

Delay:
Set not less than 0.3 seconds above the downstream solid state relay
Set not more than 1 second @ 400A
Set under cable damage curve
Set for 1.6 TD on the Moderately Inverse Curve

Instantaneous:
OFF

SUNY OSWEGO – 13.2kV SYSTEM STUDY
BUS B INCOMING GROUND FAULT DEVICE
BUS B 50/51-GF (BUS A Typical)

TCC: 002G & 003G

Device: Multilin SR-750 Relay

Existing Settings: 0.1 AT, 7.0 TD Ext. Inverse, Inst OFF.

CT Ratio: 1200:5 *Note: This relay uses CT primary amps to calculate tap settings.*

NGR: 400A @ 10 Seconds

Pickup:
Set this device to backup NGR relay
Set no lowered than 10% of CT rating
Set for 0.1 (120A)

Delay:
Set not less than 0.3 seconds above the downstream solid state relays
Set for 1.2 TD on the Moderately Inverse Curve

Instantaneous:
OFF

SUNY OSWEGO – 13.2kV SYSTEM STUDY
FEEDER 1B GROUND FAULT DEVICE
1B-50/51-GF (1A, 2A, 5A, 3B & 4B Typical))

TCC: 002G, 003G

Device: Multilin SR-750 Relay

CT Ratio: 50:5 *Note: This relay uses CT primary amps to calculate tap settings.*

Pickup:
Set not more than 67% of NGR relay
80 x 0.67 = 53.6 amps
Set for 50 amps
Set for 1.0X (50 amps)

Delay:
Set to coordinate with upstream and downstream devices.
Set for not less than 0.3 seconds below the upstream device.
Set for 0.7 TD on the Moderately Inverse Curve

Instantaneous:
Block to ride thru transients

Project Name: SUNY-OSWEGO April 2013
TCC Name: 002G.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: User Defined Store with TCC

Device Name:	T1 50/51	TCC Name:	002G.tcc
Bus Name:	0.1.1	Bus Voltage:	13200.0V
Function Name:	GF		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	400.0A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	0.4 (80A)	Test Points:	@2.0X, 1.212s
2) Mod Inverse	1.6 1		@5.0X, 0.532s
			@10.0X, 0.394s

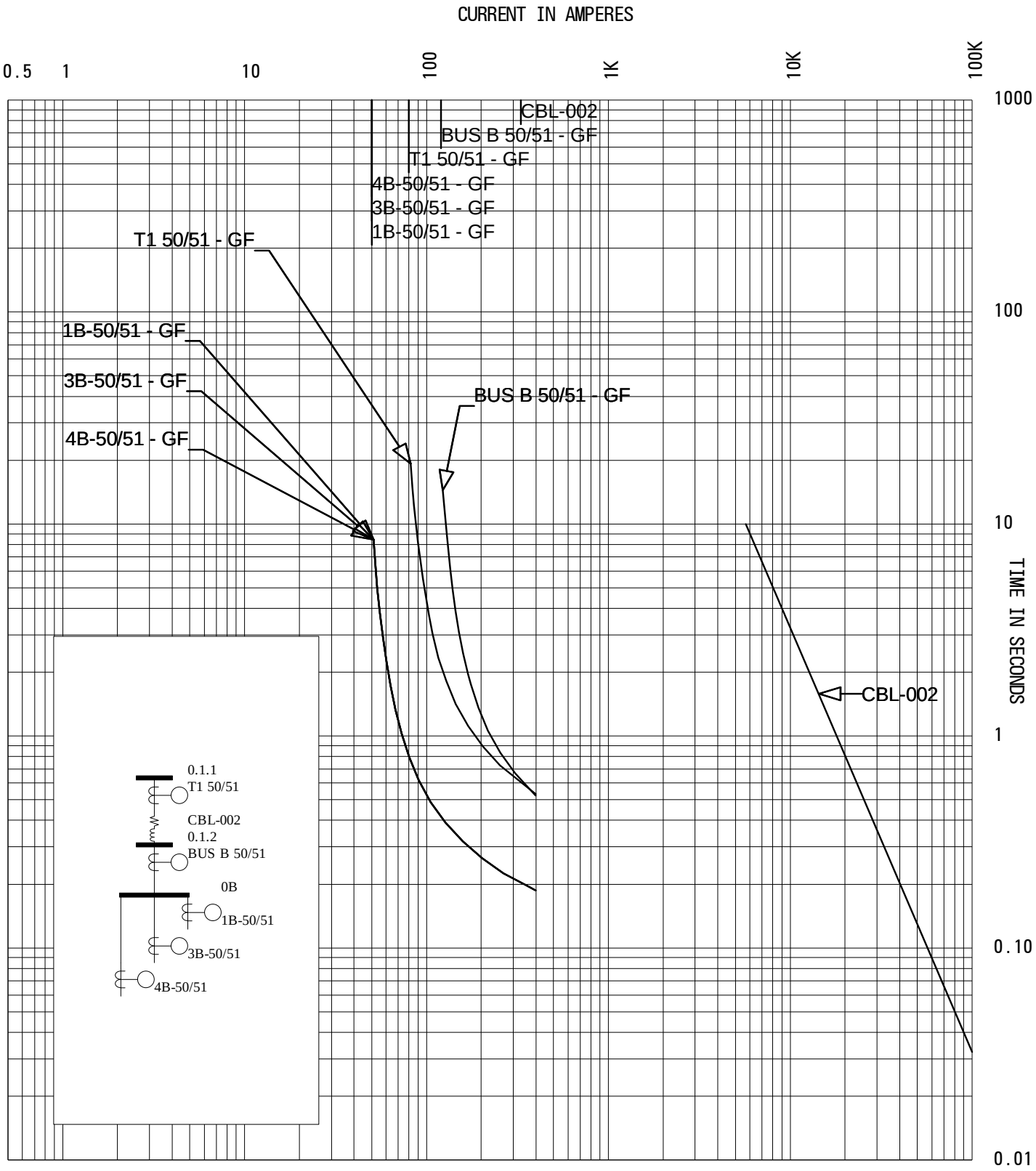
Device Name:	CBL-002	TCC Name:	002G.tcc
Bus Name:	0.1.1	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	250	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	BUS B 50/51	TCC Name:	002G.tcc
Bus Name:	0B	Bus Voltage:	13200.0V
Function Name:	GF		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	400.0A
Current Rating:	1200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	0.1 (120A)	Test Points:	@2.0X, 0.909s
2) Mod Inverse	1.2 1		@5.0X, 0.399s
			@10.0X, 0.296s

Device Name: 4B-50/51 TCC Name: 002G.tcc
Bus Name: 0B Bus Voltage: 13200.0V
Function Name: GF
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 400.0A
Current Rating: 50A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 1 (50A) Test Points: @2.0X, 0.530s
2) Mod Inverse 0.7 1 @5.0X, 0.233s
@10.0X, 0.173s

Device Name: 3B-50/51 TCC Name: 002G.tcc
Bus Name: 0B Bus Voltage: 13200.0V
Function Name: GF
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 400.0A
Current Rating: 50A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 1 (50A) Test Points: @2.0X, 0.530s
2) Mod Inverse 0.7 1 @5.0X, 0.233s
@10.0X, 0.173s

Device Name: 1B-50/51 TCC Name: 002G.tcc
Bus Name: 0B Bus Voltage: 13200.0V
Function Name: GF
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 400.0A
Current Rating: 50A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 1 (50A) Test Points: @2.0X, 0.530s
2) Mod Inverse 0.7 1 @5.0X, 0.233s
@10.0X, 0.173s



TCC Name: 002G
Oneline: 002G - Bank 1 3.2kV Ground Fault
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

Project Name: SUNY-OSWEGO April 2013(Base Project)
TCC Name: 003G.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: User Defined Store with TCC

Device Name:	T2-50/51	TCC Name:	003G.tcc
Bus Name:	0.2.1	Bus Voltage:	13200.0V
Function Name:	GF		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	400.0A
Current Rating:	200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	0.4 (80A)	Test Points:	@2.0X, 1.212s
2) Mod Inverse	1.6 1		@5.0X, 0.532s
			@10.0X, 0.394s

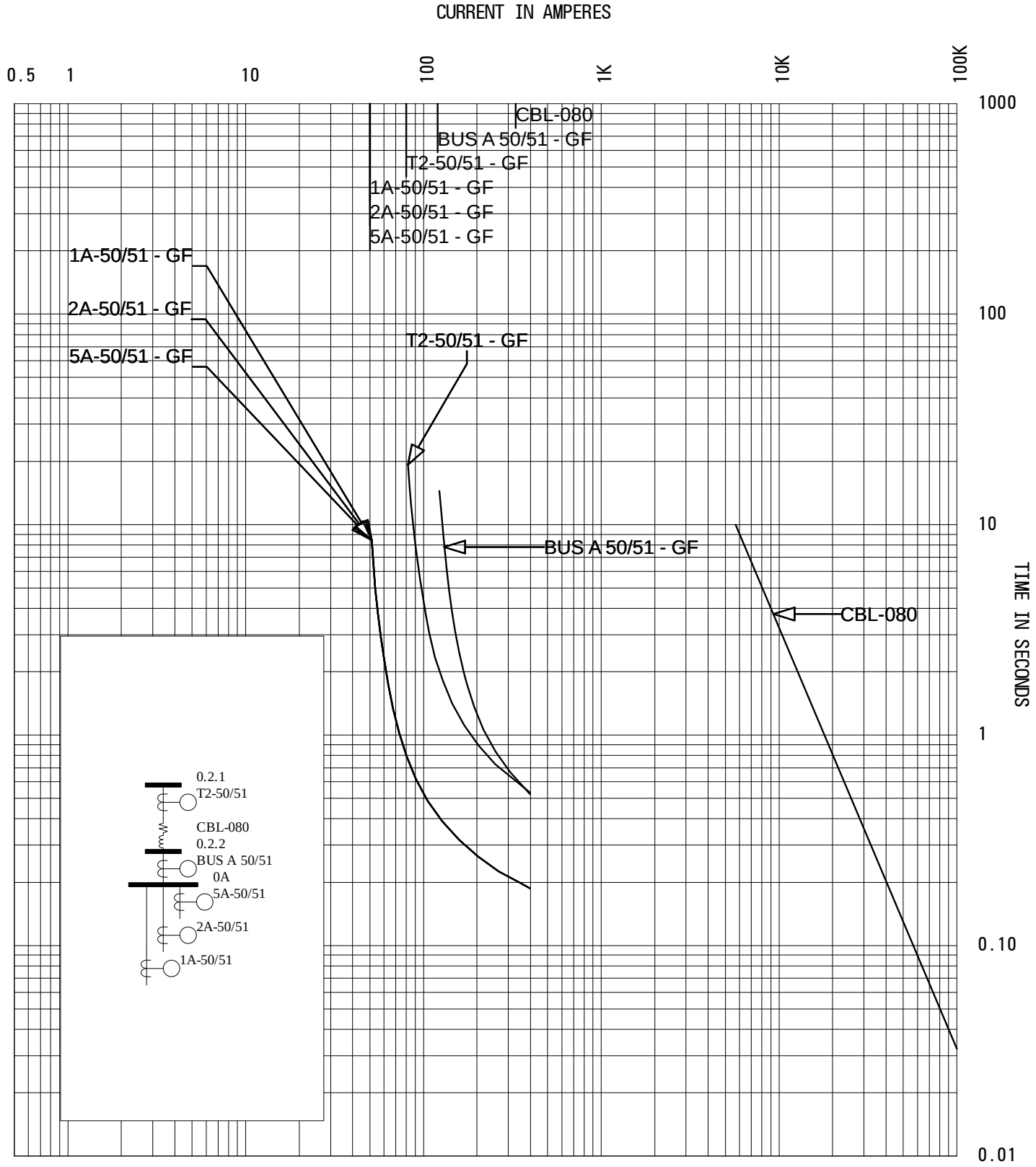
Device Name:	CBL-080	TCC Name:	003G.tcc
Bus Name:	0.2.1	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	250	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

Device Name:	BUS A 50/51	TCC Name:	003G.tcc
Bus Name:	0A	Bus Voltage:	13200.0V
Function Name:	GF		
Manufacturer:	MULTILIN		
Description:	5A CT Sec		
Type:	SR750/760 Feeder Relay	Class Desc:	SR760
AIC Rating:	N/A	Fault Duty:	400.0A
Current Rating:	1200A / 5A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Setting: 1) OC Pickup	0.1 (120A)	Test Points:	@2.0X, 0.909s
2) Mod Inverse	1.2 1		@5.0X, 0.399s
			@10.0X, 0.296s

Device Name: 1A-50/51 TCC Name: 003G.tcc
Bus Name: 0A Bus Voltage: 13200.0V
Function Name: GF
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 400.0A
Current Rating: 50A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 1 (50A) Test Points: @2.0X, 0.530s
2) Mod Inverse 0.7 1 @5.0X, 0.233s
@10.0X, 0.173s

Device Name: 2A-50/51 TCC Name: 003G.tcc
Bus Name: 0A Bus Voltage: 13200.0V
Function Name: GF
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 400.0A
Current Rating: 50A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 1 (50A) Test Points: @2.0X, 0.530s
2) Mod Inverse 0.7 1 @5.0X, 0.233s
@10.0X, 0.173s

Device Name: 5A-50/51 TCC Name: 003G.tcc
Bus Name: 0A Bus Voltage: 13200.0V
Function Name: GF
Manufacturer: MULTILIN
Description: 5A CT Sec
Type: SR750/760 Feeder Relay Class Desc: SR760
AIC Rating: N/A Fault Duty: 400.0A
Current Rating: 50A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) OC Pickup 1 (50A) Test Points: @2.0X, 0.530s
2) Mod Inverse 0.7 1 @5.0X, 0.233s
@10.0X, 0.173s



TCC Name: 003G
Oneline: 003G - 13.2kV Bank 2 Ground Fault
June 21, 2013 3:10 PM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 35kV Substation Expansion
Transformer #3 Secondary Neutral Overcurrent Relay
T3-51N (Trips Primary Breaker)

TCC: 004G

Device: SEL-387

CT Ratio: 200:5 (40:1)

Existing Settings: None new device

NGR Rating 400A for 10 seconds

Pickup (51N1P):
Set no more than 20% of resistor rating 400 x 0.2 = 80A
Set not less than 150% of the largest feeder device
50 x 1.5 = 75A
Set for 2.0AT (80A)

Delay (51N1C/51N1D):
Set for not more than 1 second at 400A
Set no less than 0.3 seconds above the downstream device
Set for 2.3 TD on the U1 Moderately Inverse Curve

Instantaneous (50N1P):
OFF

SUNY OSWEGO – 35kV Substation Expansion
Transformer #3 Secondary Residual Ground Fault Relay
T3-51 (Trips Secondary Breaker)

TCC: 004G

Device: SEL-551

CT Ratio: 1200:5 MR Ratio CT Tapped at 600:5 (120:1)

Existing Settings: None new device

NGR Rating 400A for 10 seconds

Pickup (51G1P):
Set no more than 20% of resistor rating 400 x 0.2 = 80A
Set not less than 150% of the largest feeder device
50 x 1.5 = 75A
Set for 0.7AT (84A)

Delay (51G1C/51G1D):
Match Upstream device as backup
Set no less than 0.3 seconds above the downstream device
Set for 2.2 TD on the U1 Moderately Inverse Curve

Instantaneous (50G1P):
OFF

SUNY OSWEGO – 13.2kV SYSTEM STUDY
BUS C INCOMING GROUND FAULT DEVICE
BUS C 50/51-GF

TCC: 004G

Device: SEL-351

Existing Settings: Unknown.

CT Ratio: 1200:5 MR Tapped at 1200:5
Tap @ 600:5

NGR: 400A @ 10 Seconds

Pickup (51G1P):
Set this device to backup NGR relay
Set no lowered than 10% of CT rating
Set for 0.7 (84A)

Delay (51G1TD, 51G1C):
Set not less than 0.3 seconds above the downstream solid state relays
Set for 1.4 TD on the U1 Moderately Inverse Curve

Instantaneous:
OFF

SUNY OSWEGO – 13.2kV SYSTEM STUDY
FEEDER 1B GROUND FAULT DEVICE
2C-50/51-GF (3C, 4C & 5C Typical))

TCC: 004G

Device: SEL-751 Relay

Existing Settings: Unknown

CT Ratio: 50:5

Pickup:
Set not more than 67% of NGR relay
80 x 0.67 = 53.6 amps
Set for 50 amps
Set for 5.0AT (50 amps)

Delay:
Set to coordinate with upstream and downstream devices.
Set for not less than 0.3 seconds below the upstream device
Set not less than 0.1 seconds at 400A to ride through transients
Set for 0.7 TD on the U1 Moderately Inverse Curve

Instantaneous:
Block to ride thru transients

Project Name: SUNY-OSWEGO April 2013
TCC Name: 004G.tcc
Reference Voltage: 13200 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: User Defined Store with TCC

Device Name:	T3 -51			TCC Name:	004G.tcc
Bus Name:	0.3.1			Bus Voltage:	13200.0V
Function Name:	GF				
Manufacturer:	SEL				
Description:	50N/51N, 5A Rated				
Type:	551			Class Desc:	
AIC Rating:	N/A			Fault Duty:	400.0A
Current Rating:	600A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51N1P	0.7	(84A)	Test Points:	@2.0X, 1.698s
2)	U1, Mod Inv	2.2			@5.0X, 0.758s
					@10.0X, 0.544s

Device Name:	T3 51N			TCC Name:	004G.tcc
Bus Name:	0.3.1			Bus Voltage:	13200.0V
Function Name:	Neutral				
Manufacturer:	SEL				
Description:	50N/51N, 5A Rated				
Type:	387			Class Desc:	
AIC Rating:	N/A			Fault Duty:	400.0A
Current Rating:	200A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51NnP	2	(80A)	Test Points:	@2.0X, 1.766s
2)	U1, Mod Inv	2.3			@5.0X, 0.783s
					@10.0X, 0.560s

Device Name:	CBL-083	TCC Name:	004G.tcc
Bus Name:	0.3.1	Bus Voltage:	13200.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	250	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	250 deg C.

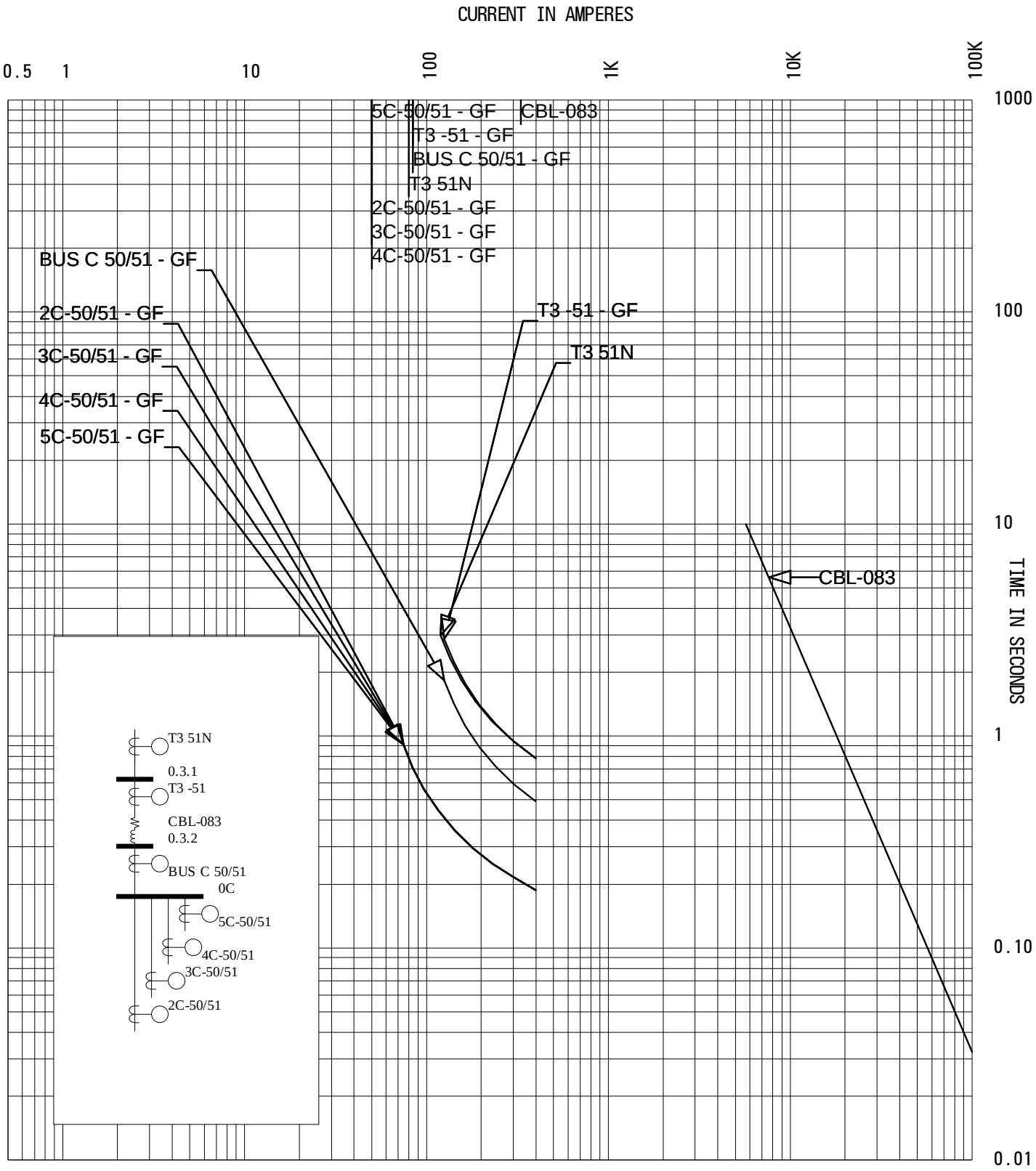
Device Name: BUS C 50/51 TCC Name: 004G.tcc
Bus Name: 0C Bus Voltage: 13200.0V
Function Name: GF
Manufacturer: SEL
Description: 50N/51N, 5A nom.
Type: 351-0, -1, -2, -3, -4 Class Desc: 351-1
AIC Rating: N/A Fault Duty: 400.0A
Current Rating: 600A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) 51NP 0.7 (84A) Test Points: @2.0X, 1.075s
2) U1, Mod Inv 1.4 @5.0X, 0.477s
@10.0X, 0.341s

Device Name: 2C-50/51 TCC Name: 004G.tcc
Bus Name: 0C Bus Voltage: 13200.0V
Function Name: GF
Manufacturer: SEL
Description: 50N/51N, 5A nom.
Type: 751A Class Desc: SEL751A
AIC Rating: N/A Fault Duty: 400.0A
Current Rating: 50A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) 51N1P, (0.5-16 x CTR 5 (50A) Test Points: @2.0X, 0.537s
2) U1, Moderately Inver 0.7 @5.0X, 0.238s
@10.0X, 0.170s

Device Name: 3C-50/51 TCC Name: 004G.tcc
Bus Name: 0C Bus Voltage: 13200.0V
Function Name: GF
Manufacturer: SEL
Description: 50N/51N, 5A nom.
Type: 751A Class Desc: SEL751A
AIC Rating: N/A Fault Duty: 400.0A
Current Rating: 50A / 5A Curve Multiplier: 1
Time Multiplier: 1 Time Adder: 0
Setting: 1) 51N1P, (0.5-16 x CTR 5 (50A) Test Points: @2.0X, 0.537s
2) U1, Moderately Inver 0.7 @5.0X, 0.238s
@10.0X, 0.170s

Device Name:	4C-50/51			TCC Name:	004G.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	GF				
Manufacturer:	SEL				
Description:	50N/51N, 5A nom.				
Type:	751A			Class Desc:	SEL751A
AIC Rating:	N/A			Fault Duty:	400.0A
Current Rating:	50A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51N1P, (0.5-16 x CTR	5	(50A)	Test Points:	@2.0X, 0.537s
2)	U1, Moderately Inver	0.7			@5.0X, 0.238s
					@10.0X, 0.170s

Device Name:	5C-50/51			TCC Name:	004G.tcc
Bus Name:	0C			Bus Voltage:	13200.0V
Function Name:	GF				
Manufacturer:	SEL				
Description:	50N/51N, 5A nom.				
Type:	751A			Class Desc:	SEL751A
AIC Rating:	N/A			Fault Duty:	400.0A
Current Rating:	50A / 5A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Setting: 1)	51N1P, (0.5-16 x CTR	5	(50A)	Test Points:	@2.0X, 0.537s
2)	U1, Moderately Inver	0.7			@5.0X, 0.238s
					@10.0X, 0.170s



TCC Name: 004G
Oneline: 004G - 13.2kV Bank 3 Ground Fault
April 26, 2013 11:32 AM

Current Scale x 1

Reference Voltage: 13200
SUNY OSWEGO
35kV SUB EXPANSION

SUNY OSWEGO – 13.2kV SYSTEM STUDY

Lee Hall Generator Standby Breaker (Load Bank Breaker Typical)
Standby Bkr (Load Bank Bkr typical)

Tcc:	G01, G02
New Device:	Siemens MXD6 Sentron, 800A MCB w/Thermal Magnetic Trip
Feeders:	2 Per Phase, 4-Wire, 600 MCM, Rated at 840 amps

Breaker Size:
Set not more than the feeder rating
Set not more than the upstream device 400kW / 0.8 = 500 / 0.48 = 1042
Set not less than 150% of the largest downstream device 400 x 1.5 = 600
Size for 800A (Fixed)

Instantaneous:
Set to coordinate with the downstream devices
Set to mitigate arc flash hazards
Set for Lo

Project Name: SUNY-OSWEGO April 2013(Scenario1)
TCC Name: G01.tcc
Reference Voltage: 480 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	Lee Gen	TCC Name:	G01.tcc
Bus Name:	G01	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Generator Decrement Curve	Size:	500.0KVA
Xd": 0.1000	Td": 0.0150	Power Factor:	0.800 Lead
Xd': 0.1500	Td': 0.4000	Ifg: 1.0000	
Xd: 1.60	Ta: 0.2000	If: 3.0000	

Device Name:	CBL-0281	TCC Name:	G01.tcc
Bus Name:	1A01A.1.3	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	2
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	CBL-0282	TCC Name:	G01.tcc
Bus Name:	G01.1	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	2
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	CBL-0283	TCC Name:	G01.tcc
Bus Name:	G01	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	2
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	Standby Bkr	TCC Name:	G01.tcc
Bus Name:	G01.1	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	SIEMENS		
Description:	500-800A		
Type:	MXD6 Sentron		
AIC Rating:	50kA	Fault Duty:	3963.5A
Frame:	MXD6 480V 800A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	800A		

Setting: 1) Thermal Curve (Fixed
2) INST (LO-HI) LO (4000A)

Device Name:	CBL-0284	TCC Name:	G01.tcc
Bus Name:	G01	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	2
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	Load Bank Bkr	TCC Name:	G01.tcc
Bus Name:	G01.2	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	SIEMENS		
Description:	500-800A		
Type:	MXD6 Sentron		
AIC Rating:	50kA	Fault Duty:	3963.5A
Frame:	MXD6 480V 800A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	800A		

Setting: 1) Thermal Curve (Fixed
2) INST (LO-HI) LO (4000A)

Device Name:	PP-4 Fdr	TCC Name:	G01.tcc
Bus Name:	1A01A.1.4	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	100-400A		
Type:	HKD		
AIC Rating:	65kA	Fault Duty:	3626.6A
Frame:	HKD 480V 400A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	400A		

Setting: 1) Thermal Curve (Fixed
2) INST (5-10 x Trip) 5 (2000A)

Device Name:	EPL-1 Fdr	TCC Name:	G01.tcc
Bus Name:	1A01A.1.4	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	100-400A		
Type:	HKD		
AIC Rating:	65kA	Fault Duty:	3626.6A
Frame:	HKD 480V 400A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	400A		

Setting: 1) Thermal Curve (Fixed
2) INST (5-10 x Trip) 5 (2000A)

Device Name:	EPL-1 Xfmr	TCC Name:	G01.tcc
Bus Name:	1A01A.1.4.2	Bus Voltage:	480.0V / 208V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	2-Winding Transformer Damage Curve	Rated Volts:	480 LL/208 LL
Nominal Size:	225.0kVA		
Impedance (%Z):	5.1700	Pri Connection:	Delta
Inrush Factor:	12.0x	Sec Connection:	Wye-Ground

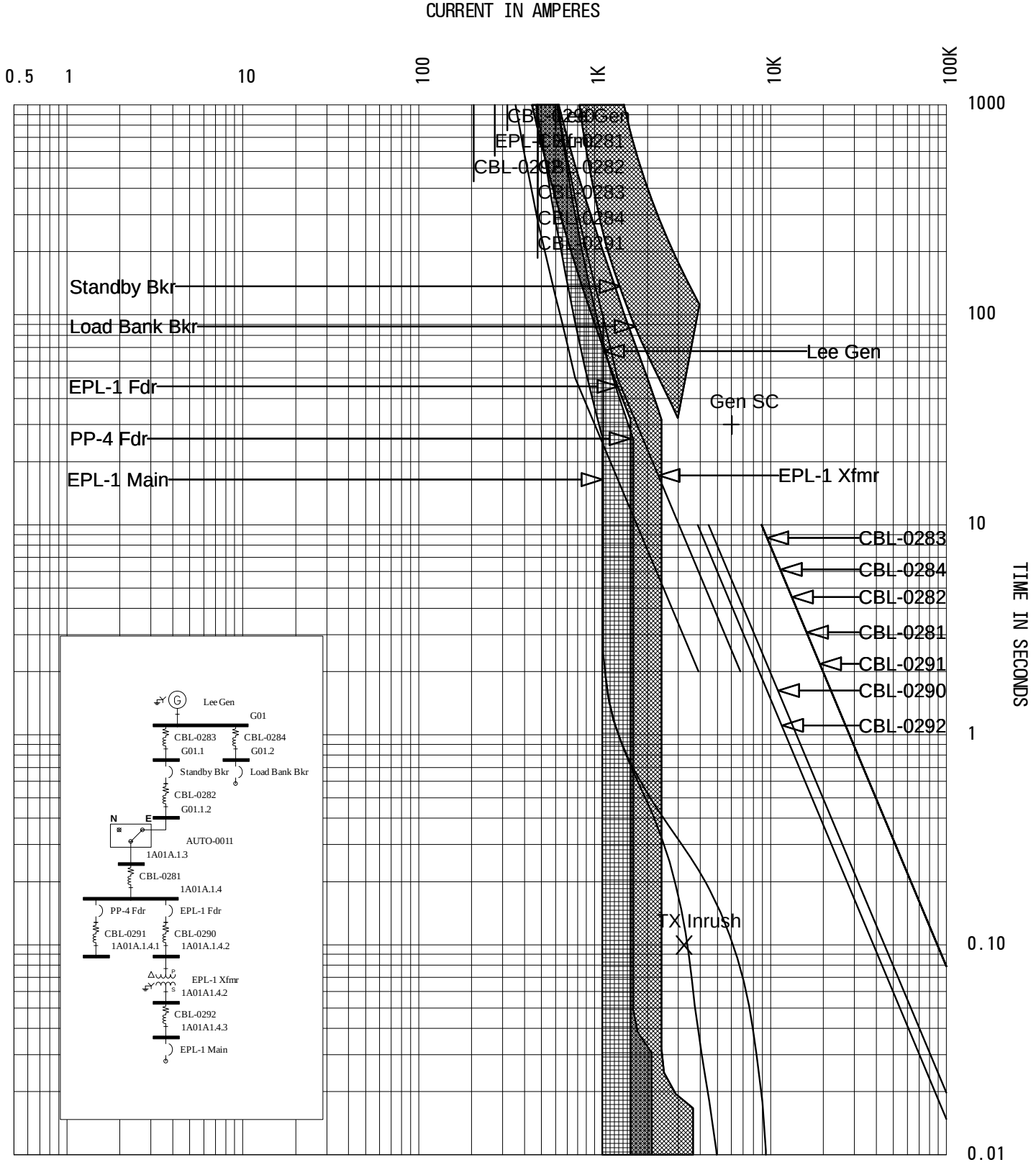
Device Name:	CBL-0290	TCC Name:	G01.tcc
Bus Name:	1A01A.1.4	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	300	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	CBL-0291	TCC Name:	G01.tcc
Bus Name:	1A01A.1.4	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	1
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	CBL-0292	TCC Name:	G01.tcc
Bus Name:	1A01A1.4.2	Bus Voltage:	208.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	2
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	EPL-1 Main	TCC Name:	G01.tcc
Bus Name:	1A01A1.4.3	Bus Voltage:	208.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	300-800A		
Type:	MDLB		
AIC Rating:	65kA	Fault Duty:	4902.9A
Frame:	MDLB 240V 800A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	800A		

Setting: 1) Thermal Curve (Fixed
2) INST (4-8 x Trip) 4 (3200A)



TCC Name: G01
Oneline: G01
June 21, 2013 3:39 PM

Current Scale x 1

Reference Voltage: 480
SUNY OSWEGO
35kV SUB EXPANSION

Project Name: SUNY-OSWEGO April 2013(Scenario1)
TCC Name: G02.tcc
Reference Voltage: 480 V
Current Scale: X 10^0
TCC Notes:
TCC Comment:
Fault Duty Option: Study Result - Bus Fault Current

Device Name:	EPP-1 Fdr			TCC Name:	G02.tcc
Bus Name:	1A01A.1.1			Bus Voltage:	480.0V
Function Name:	Phase				
Manufacturer:	CUTLER-HAMMER				
Description:	LSI, 200-5000A				
Type:	DS, RMS 510/610/810/910				
AIC Rating:	30kA ShortTime:30			Fault Duty:	200000.0A
Frame:	DS-206 480V 800A			Curve Multiplier:	1
Time Multiplier:	1			Time Adder:	0
Sensor:	800A				
Plug:	800A				
Setting:	1) LTPU (0.5-1.0 x P)	1	(800A)		
	2) LTD (2-24 Sec.)	4			
	3) STPU (2-10 x LTPU)	4	(3200A)		
	4) STD (0.1-0.5 Sec.)	0.3 Sec.	I^2 t Out		
	5) INST (2-12 x P)	6	(4800A)		

Device Name:	CBL-0287	TCC Name:	G02.tcc
Bus Name:	1A01A.1.1	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	2
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	CBL-0282	TCC Name:	G02.tcc
Bus Name:	G01.1	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	2
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

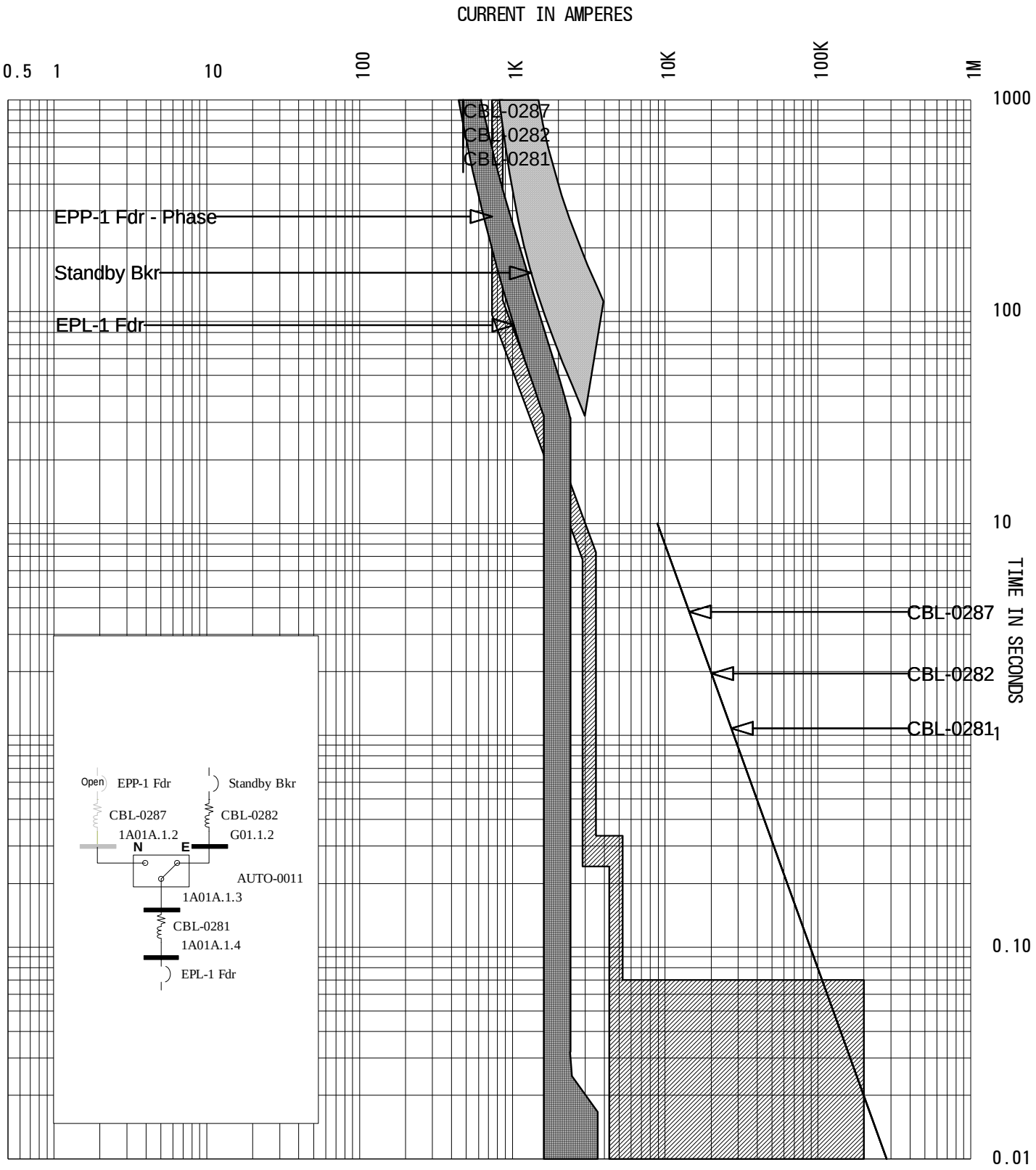
Device Name:	Standby Bkr	TCC Name:	G02.tcc
Bus Name:	G01.1	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	SIEMENS		
Description:	500-800A		
Type:	MXD6 Sentron		
AIC Rating:	50kA	Fault Duty:	3963.5A
Frame:	MXD6 480V 800A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	800A		

Setting: 1) Thermal Curve (Fixed
2) INST (LO-HI) LO (4000A)

Device Name:	CBL-0281	TCC Name:	G02.tcc
Bus Name:	1A01A.1.3	Bus Voltage:	480.0V
		Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Description:	Cable Damage Curve	Qty/Ph:	2
Size:	600	Cont. Temp:	90 deg C.
Material:	Copper	Damage Temp:	150 deg C.

Device Name:	EPL-1 Fdr	TCC Name:	G02.tcc
Bus Name:	1A01A.1.4	Bus Voltage:	480.0V
Function Name:	Phase		
Manufacturer:	CUTLER-HAMMER		
Description:	100-400A		
Type:	HKD		
AIC Rating:	65kA	Fault Duty:	3626.6A
Frame:	HKD 480V 400A	Curve Multiplier:	1
Time Multiplier:	1	Time Adder:	0
Trip:	400A		

Setting: 1) Thermal Curve (Fixed
2) INST (5-10 x Trip) 5 (2000A)



TCC Name: G02
Oneline: G02
June 21, 2013 3:39 PM

Current Scale x 1

Reference Voltage: 480
SUNY OSWEGO
35kV SUB EXPANSION

5.0 ARC FLASH STUDY

5.1 Objective:

To determine the arc flash boundary and incident energy at each bus included in the study. This is used to determine safe working distances, personal protective equipment (PPE) required for working on energized equipment and requirements for safe working practices at each location.

Arc flash computer printouts and recommendations for each location included in the study are included in this section.

5.2 Methods:

- The IEEE-1584 2004a method of determining arc flash was used for this study.
- Motor Contributions 75 HP and greater were used. These were sustained for 5 cycles.
- Best engineering judgment was used to evaluate and increase PPE Category, where it was deemed appropriate, such as two busses connected with a normally open tie.
- The required PPE Category, identified herein, was based on calculated arc flash incident energy and arc flash boundary at each bus included in this study. Required PPE outlined in NFPA 70E Article 130 Table 130.7 (C) (9) (a) is task based and may differ from the PPE recommended herein.

5.3 Arc Flash Background Information:

Arc Flash is the result of a rapid release of energy due to an arcing fault between a phase conductor/bus and another phase conductor/bus, neutral or a ground. During an arc fault the air ionizes and becomes the conductor.

An electric arc flash can occur if a conductive object gets too close to a high-amp current source or by equipment failure (for example, while opening or closing a disconnect switch). The arc can heat the air to temperatures as high as 35,000° F, and vaporize metal in the equipment. The arc flash can cause severe skin burns by direct heat exposure and by igniting clothing.

The rapid heating of the air and vaporization of metal generates a pressure wave centered on the origin of the arc. Dependent on its severity, this pressure wave can damage hearing, cause memory loss (from concussion), or even death.

5.4 Codes and Standards:

There are four separate industry standards for the prevention of arc flash incidents:

1. OSHA 29 Code of Federal Regulations (CFR) Part 1910 Subpart S.
2. NFPA 70-2011 National Electrical Code.
3. NFPA 70E-2012 Standard for Electrical Safety Requirements for Employee Workplaces.
4. IEEE Standard 1584-2004a Guide for Performing Arc Flash Hazard Calculations.

5.5 Equipment Labeling:

NFPA 70-2011, National Electrical Code Section 110.16 requires that a warning label be placed on equipment likely to cause arc flash conditions. The labels shall contain the equipment's flash protection boundary, incident energy level, and the required personal protective equipment (PPE). In addition, the label will also include the limited approach, restricted approach and prohibited approach boundary.

- The **Flash Hazard Boundary** is an imaginary sphere that surrounds the potential arc point "within which a person could receive a second degree burn if an electrical arc flash were to occur," according to NFPA 70E. All work within this boundary requires the use of appropriate PPE.

- The **Limited Approach Boundary** is the closest distance an unqualified person can approach, unless accompanied by a qualified person.

- The **Restricted Approach Boundary** is the closest distance to exposed live parts a qualified person can approach without proper PPE and tools. Inside this boundary, unintentional movement can place a part of the body or conductive tools in contact with live parts or inside the **Prohibited Approach Boundary**.

- The **Prohibited Approach Boundary** is the minimum approach distance to exposed live parts to prevent flashover or arcing. Approach within this limit is equivalent to making direct contact with a live part.

Labels should be procured and affixed to the corresponding equipment.

5.6 Personal Protective Equipment (PPE):

Personal protective equipment Categories referenced in this report are defined in NFPA 70E Article 130, Table 130.7(C)(10) and Table 130.7(C)(11) and are identified as Category 0, Category 1, Category 2, Category 3 and Category 4. All PPE Categories shall include the appropriate high voltage, eye and hearing protection.

5.7 Training:

A comprehensive safety training program should be developed, implemented and maintained to familiarize personnel who could come in contact with exposed energized electrical equipment and arc flash hazards. This program should include, but not be limited to the following:

- Company mandated safe work practices
- Identification of arc flash hazards
- Elimination of arc flash hazards
- Mitigation of arc flash hazards that cannot be eliminated
- Determination of what PPE is required and when
- The proper use of PPE
- Safety inspections and toolbox safety meeting
- Lock out tag out procedures (LOTO)
- Proper testing and grounding of electrically isolated equipment
- First aid including CPR and the treatment of burns

5.8 Energized Electrical Work Permit:

An energized electrical work permit shall be executed and approved prior to any employee or contractor performing work on energized equipment. This form should include the following information:

- Location of work
- Circuit identification
- Description of the work to be performed
- Flash Boundary
- Flash Hazard
- Working Distance
- Shock Hazard
- Limited Approach limits
- Restricted Approach limits
- Prohibited Approach limits
- Glove Class, Required PPE
- Means of restricting access of unqualified personnel
- Signatory Approvals

5.9 Study Limits:

This report contains the results of a limited scope Arc Flash Study for system under study as outlined in the PDC STUDY MODEL (One Line Diagrams) included in Section 8 of this report.

continued

5.9 Study Limits - continued:

The arc flash boundary and incident energy were determined based on IEEE 1584 2004a calculations using data from the short circuit study. Fault clearing times for each bus were determined using the existing protective devices at the available fault current.

This study was performed in accordance with applicable IEEE Standards and based upon data collected by HMT during a site inspection and data furnished by the Ridley Electric, and National Grid.

5.10 General Recommendations:

NOTE: The required PPE Category, identified herein, was based on calculated arc flash incident energy and arc flash boundary at each bus included in this study. Required PPE outlined in NFPA 70E Article 130 Table 130.7 (C) (9) (a) is task based and may differ from the PPE recommended herein.

1. Work on electrical equipment should only be performed by qualified and trained personnel.

2. All work that exposes personnel to energized bus (except for racking and removing circuit breakers) is prohibited.

3. Proper lock-out-tag-out procedures should be implemented and followed.

4. Category 2 PPE is recommended when performing work on de-energized equipment.

5. Never remove covers or open doors on equipment that will expose energized components.

6. If possible, personnel should never stand directly in front of a breaker or switch that is being operated. The operator should always stand to one side, to mitigate the effects of an arc flash/blast, should one occur.

7. Category 4 PPE must be utilized when applying/removing grounds at all locations within the substations. Grounds must be appropriately rated for the available fault current.

8. All Categories of PPE shall include the appropriate high voltage, eye and hearing protection.

9. When switching operations are being performed, the appropriately rated high voltage gloves shall be employed.

10. Where Category 4 PPE is recommended the Flash Suit shall be rated not less than 40 cal/cm^2.

continued

5.10 General Recommendations - continued:

11. An up to date system one line shall be consulted prior to performing any switching operations.

5.11 Arc Flash DANGEROUS Locations and Remediation:

This facility was found to have twenty-two (22) Dangerous Busses that could not be corrected by settings changes. These have been listed by location with remediation action(s) at the end of this section.

a) 1A01A.1 (Lee 480V Transformer Secondary Bus)
b) 1A02.1 (Riggs 208V Transformer Secondary Bus)
c) 1A03.1 (Johnson 208V Transformer Secondary Bus)
d) 1A04.1 (Lakeside 208V Transformer Secondary Bus)
e) 2A01.1 (Swetman 208V Transformer Secondary Bus)
f) 2A02.1 (SNYGG 208V Transformer Secondary Bus)
g) 2A03.1 (Wilbur 208V Transformer Secondary Bus)
h) 3B01.1 (Convocation Center 480V Transformer Secondary Bus)
i) 3B02.1 (Penfield 480V Transformer Secondary Bus)
j) 3B03.1 (Lanigan 208V Transformer Secondary Bus)
k) 3B04.1 (Mahar 208V Transformer Secondary Bus)
l) 3C02.1 (Cooper 208V Transformer Secondary Bus)
m) 3C04.1 (Culkin 480V Transformer Secondary Bus)
n) 4B01.1 (Onondaga 208V Transformer Secondary Bus)
o) 4C01.1 (Hewitt 208V Transformer Secondary Bus)
p) 4C01.2 (Hewitt 480V Transformer Secondary Bus)
q) 4C02.1 (Tyler 208V Transformer Secondary Bus)
r) 4C03.1 (Seneca 208V Transformer Secondary Bus)
s) 5C01.1 (Piez 1-TN-1 480V Transformer Secondary Bus)
t) 5C01.1.2 (Piez 1-SWBDN-1 480V #1 Main Line Bus)
u) 5C01.2 (Piez L-TN-3 480V Transformer Secondary Bus)
v) 5C012.1 (Piez 1-SWBDN-1 480V #2 Main Line Bus)

A Dangerous rating is quite common on a low voltage transformer's secondary bus or on the line side bus of a low voltage breaker or fused switch fed by that transformer. These busses are typically only protected by the transformer's primary device. A device placed on the medium voltage side of a low voltage secondary transformer typically cannot act quickly enough to reduce the potential arc flash hazard to a manageable level, especially for a delta primary-wye secondary transformer with a fused primary. Equipment upgrades to correct this condition require the installation of primary circuit breakers and micro-processor based programmable relaying.

continued

5.11 Arc Flash DANGEROUS Locations and Remediation - continued:

Based on the amount of work that is actually necessary to be performed at these buses while they are energized, the cost of implementing such upgrades far out ways the benefits.

a) In the case of a transformer secondary compartment, there is no foreseeable reason to work on the components at this location when they are energized. Any/all work in this compartment shall require the transformer to be de-energized, locked out and grounded.

b) In the case of the line side of a breaker, the only reason to work in this compartment while it is energized is to rack the secondary main breaker in and out of its cell. In the case of a fixed mounted breaker, there is no foreseeable reason to work in this compartment while it is energized. Therefore any/all work (including racking the main breaker on or off its bus) shall be performed with the transformer de-energized; its primary locked out and grounded.

SUNY OSWEGO - LEE HALL GENERATOR
ARC FLASH TABULATION
OVERALL/WORST CASE SCENARIO

Bus Name	PPE Level Base / Normal System	PPE Level Lee Generator Running	OVER ALL BUS RATING
1A01A.1.3 (Lee ATS Fdr)	Level 2 (*N3)	**Level 3 (*N9)**	**Level 3**
1A01A.1.4 (EPP-1 Panel (MLO))	Level 2 (*N3)	**Level 3 (*N9)**	**Level 3**
1A01A.1.4.1 (PP-4 (MLO))	Level 0	**Level 3 (*N3) (*N9)**	**Level 3**
1A01A.1.4.2 (EPL-1 Xfmr Primary)	Level 0	**Level 3 (*N3) (*N9)**	**Level 3**
1A01A1.4.2 (EPL-1 Xfmr Secondary)	Level 3 (*N9)	Level 3 (*N9)	Level 3
1A01A1.4.3 (EPL-1 Main)	Level 3 (*N9)	Level 3 (*N9)	Level 3
G01 (Lee Generator)	Level 3 (*N2) (*N9)	Level 3 (*N2) (*N9)	Level 3
G01.1 (Lee Standby Breaker)	Level 3 (*N2) (*N9)	Level 3 (*N2) (*N9)	Level 3
G01.1.2 (Lee ATS E Feed)	Level 3 (*N9)	Level 3 (*N9)	Level 3
G01.2 (Lee Portable Load Bank Breaker)	Level 3 (*N2) (*N9)	Level 3 (*N2) (*N9)	Level 3

SUNY OSWEGO
ARC FLASH TABULATION - LEE HALL GENERATOR

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
1A01A.1.3 (Lee ATS Fdr)	Standby Bkr	0.48	3.66	3.66	2.78	2	0.000	Yes	PNL	25	90	18	17	Level 3 (*N9)
1A01A.1.4 (EPP-1 Panel (MLO))	Standby Bkr	0.48	3.63	3.63	2.76	2	0.000	Yes	PNL	25	89	18	16	Level 3 (*N9)
1A01A.1.4.1 (PP-4 (MLO))	PP-4 Fdr	0.48	3.46	3.46	2.25	2	0.000	Yes	PNL	25	78	18	13	Level 3 (*N3) (*N9)
1A01A.1.4.2 (EPL-1 Xfmr Primary)	EPL-1 Fdr	0.48	3.61	3.61	2.33	2	0.000	Yes	PNL	25	80	18	14	Level 3 (*N3) (*N9)
1A01A1.4.2 (EPL-1 Xfmr Secondary)	EPL-1 Fdr	0.208	4.94	4.94	2.65	2	0.000	Yes	PNL	25	87	18	16	Level 3 (*N9)
1A01A1.4.3 (EPL-1 Main)	EPL-1 Fdr	0.208	4.90	4.90	2.64	2	0.000	Yes	PNL	25	87	18	16	Level 3 (*N9)
G01 (Lee Generator)	MaxTripTime @2.0s	0.48	4.00	4.00	3.00	2	0.000	Yes	PNL	25	94	18	18	Level 3 (*N2) (*N9)
G01.1 (Lee Standby Breaker)	MaxTripTime @2.0s	0.48	3.96	3.96	2.97	2	0.000	Yes	PNL	25	94	18	18	Level 3 (*N2) (*N9)
G01.1.2 (Lee ATS E Feed)	Standby Bkr	0.48	3.66	3.66	2.78	2	0.000	Yes	PNL	25	90	18	17	Level 3 (*N9)
G01.2 (Lee Portable Load Bank Breaker)	MaxTripTime @2.0s	0.48	3.96	3.96	2.97	2	0.000	Yes	PNL	25	94	18	18	Level 3 (*N2) (*N9)

SUNY OSWEGO
ARC FLASH TABULATION - LEE HALL GENERATOR

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
Level 0: Nonmelting or Untreated Fiber with Weight >= 4.5 oz/sq yd	0.0 - 1.2 cal/cm^2												#Level 0 = 0 #Level 1 = 0 #Level 2 = 0 #Level 3 = 10 #Level 4 = 0 #Danger = 0 #Equip Eval Failed = 0	(*N2) < 80% Cleared Fault Threshold (*N3) - Arcing Current Low Tolerances Used (*N9) - Max Arcing Duration Reached NFPA 70E 2012 Annex D.7 - IEEE 1584 Bus Report (80% Cleared Fault Threshold, include Ind. Motors for 60000.0 Cycles), mis-coordination checked
Level 1: Arc-rated shirt & pants or arc-rated coverall	1.2 - 4.0 cal/cm^2													
Level 2: Arc-rated shirt & pants or arc-rated coverall	4.0 - 8.0 cal/cm^2													
Level 3: Arc-rated shirt & pants + arc-rated coverall + arc-rated arc flash suit	8.0 - 25.0 cal/cm^2													
Level 4: Arc-rated shirt & pants + arc-rated coverall + arc-rated arc flash suit	25.0 - 40.0 cal/cm^2													
Level Dangerous!: DO NOT WORK ON LIVE!	40.0 - 999.0 cal/cm^2													
For additional information refer to NFPA 70 E, Standard for Electrical Safety in the Workplace.	Device with 80% Cleared Fault Threshold													

SUNY OSWEGO
ARC FLASH TABULATION - LEE HALL GENERATOR

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
Level 0: Nonmelting or Untreated Fiber with Weight >= 4.5 oz/sq yd, Safety Glasses or Goggles + Ear Canal Inserts, Leather Gloves, Safety glasses, Non-melting or untreated natural fiber (cotton/wool/rayon/silk > 4.5 oz/sq yd), shirt (long-sleeve), pants (long)., > 50V voltage rated tools + Class 0 (minimum) gloves, Dielectric shoes or insulating mat (step and touch potential).														
Level 1: Arc-rated shirt & pants or arc-rated coverall , Hardhat + Arc-rated hard hat liner + Safety Glasses or Goggles + Ear Canal Inserts, Leather Gloves, Leather work shoes, Safety glasses, electrically rated hard hat with hood and face shield., 4 cal/sq cm, Arc-rated shirt (long-sleeve) plus Arc-rated pants (long), or Arc-rated coverall, plus arc-rated face shield or arc flash suit hood, Arc-rated rainwear as needed., > 50V voltage rated tools + Class 0 (minimum) gloves and leather protectors (flash) as needed., Leather shoes (flash) as needed. Dielectric shoes or insulating mat (step and touch potential).														
Level 2: Arc-rated shirt & pants or arc-rated coverall , Hardhat + Arc-rated hard hat liner + Safety Glasses or Goggles + Ear Canal Inserts, Leather Gloves, Leather work shoes, Safety glasses, electrically rated hard hat with hood and face shield. Hearing protection., 8 cal/sq cm, Arc-rated shirt (long-sleeve) plus Arc-rated pants (long), or Arc-rated coverall, plus arc-rated flash suit hood or arc-rated face shield and arc rated balaclava, Arc-rated rainwear as needed., > 50V voltage rated tools + Class 0 (minimum) gloves and leather protectors (flash)., Leather shoes (flash) as needed. Dielectric shoes or insulating mat (step and touch potential).														
Level 3: Arc-rated shirt & pants + arc-rated coverall + arc-rated arc flash suit , Hardhat + Arc-rated hard hat liner + Safety Glasses or Goggles + Ear Canal Inserts, Arc-rated Gloves, Leather work shoes, Safety glasses, electrically rated hard hat with hood and face shield. Hearing protection., 25 cal/sq cm, Arc-rated shirt (long-sleeve) plus Arc-rated pants (long) plus Arc-rated coverall, plus arc rated arc flash suit jacket, pants, & hood, Arc-rated rainwear as needed., > 50V voltage rated tools + Class 0 (minimum) gloves and leather protectors (flash)., Leather shoes (flash) as needed. Dielectric shoes or insulating mat (step and touch potential).														
Level 4: Arc-rated shirt & pants + arc-rated coverall + arc-rated arc flash suit , Hardhat + Arc-rated hard hat liner + Safety Glasses or Goggles + Ear Canal Inserts, Arc-rated Gloves, Leather work shoes, Safety glasses, electrically rated hard hat with hood and face shield. Hearing protection., 40 cal/sq cm, Arc-rated shirt (long-sleeve) plus Arc-rated pants (long) plus Arc-rated coverall, plus arc rated arc flash suit jacket, pants, & hood, Arc-rated rainwear as needed., > 50V voltage rated tools + Class 0 (minimum) gloves and leather protectors (flash)., Leather shoes (flash) as needed. Dielectric shoes or insulating mat (step and touch potential).														
Level Dangerous!: DO NOT WORK ON LIVE!, DO NOT WORK ON LIVE!, DO NOT WORK ON LIVE!, DO NOT WORK ON LIVE!, DO NOT WORK ON LIVE!, No FR Category Found														

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
0.000 (35kV Substation Bus)	NMPC 50/51	34.50	6.30	6.30	6.30	0.017	0.083	Yes	SWG	153	107	36	13	Level 3 (*N11)
0.01 (Transformer T1 Primary Bus)	T1 P-50/51 BU	34.50	6.30	6.30	6.30	0.017	0.083	Yes	SWG	153	107	36	13	Level 3 (*N11)
0.02 (Transformer T2 Primary Bus)	T2 P-50/51 BU	34.50	6.30	6.30	6.30	0.017	0.083	Yes	SWG	153	107	36	13	Level 3 (*N11)
0.03 (Transformer T3 Primary Bus)	T3 P-50/51 BU	34.50	6.30	6.30	6.30	0.017	0.083	Yes	SWG	153	107	36	13	Level 3 (*N11)
0.1 (Transformer T1 Secondary Bus)	T1 P-50/51	13.20	2.51	2.51	2.12	1.589	0.083	Yes	SWG	153	125	36	4.0	Level 2 (*N3)
0.1.1 (Breaker M1 Line)	T1 P-50/51	13.20	2.51	2.51	2.12	1.59	0.083	Yes	SWG	153	125	36	4.0	Level 2 (*N3)
0.1.2 (Main Breaker B Line)	T1 50/51	13.20	2.41	2.41	2.04	1.244	0.083	Yes	SWG	153	95	36	3.1	Level 1 (*N3)
0.2 (Transformer T2 Secondary Bus)	T2 P-50/51	13.20	2.51	2.51	2.12	1.589	0.083	Yes	SWG	153	125	36	4.0	Level 2 (*N3)
0.2.1 (Breaker M2 Line)	T2 P-50/51	13.20	2.51	2.51	2.12	1.59	0.083	Yes	SWG	153	125	36	4.0	Level 2 (*N3)
0.2.2 (Main Breaker A Line)	T2-50/51	13.20	2.41	2.41	2.04	1.244	0.083	Yes	SWG	153	95	36	3.1	Level 1 (*N3)
0.3 (Transformer T3 Secondary Bus)	T3 P-50/51 BU	13.20	3.47	3.47	3.43	1.044	0.083	Yes	SWG	153	143	36	4.6	Level 2

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
0.3.1 (Breaker M3 Line)	T3 P-50/51 BU	13.20	3.47	3.47	3.43	1.045	0.083	Yes	SWG	153	143	36	4.6	Level 2
0.3.2 (Main Breaker C Line)	T3 -51	13.20	3.30	3.30	3.26	0.785	0.083	Yes	SWG	153	103	36	3.3	Level 1
0A (Switchgear A)	BUS A 50/51	13.20	2.41	2.41	2.04	0.829	0.083	Yes	SWG	153	64	36	2.1	Level 1 (*N3)
0B (Switchgear B)	BUS B 50/51	13.20	2.41	2.41	2.04	0.829	0.083	Yes	SWG	153	64	36	2.1	Level 1 (*N3)
0C (Switchgear C)	BUS C 50/51	13.20	3.30	3.30	2.77	0.653	0.083	Yes	SWG	153	73	36	2.4	Level 1 (*N3)
1A.01 (LEE Hall Vista Switch)	1A-50/51	13.20	2.41	2.41	2.40	0.309	0.083	Yes	SWG	153	32	36	1.1	Level 0
1A.01A (LEE Hall Electric Room Primary)	1A-50/51	13.20	2.41	2.41	2.39	0.309	0.083	Yes	SWG	153	32	36	1.1	Level 0
1A.01A.1 (LEE 480V Transformer Primary)	LEE-FU-1	13.20	2.41	2.41	2.39	0.01	0.000	Yes	SWG	153	1	36	0.03	Level 0
1A.01A.2 (LEE 208V Transformer Primary)	LEE-FU-2	13.20	2.41	2.41	2.39	0.01	0.000	Yes	SWG	153	1	36	0.03	Level 0
1A.02 (Riggs Vista Switch)	1A-50/51	13.20	2.30	2.30	2.29	0.323	0.083	Yes	SWG	153	32	36	1.1	Level 0
1A.02.1 (Riggs Transformer Primary)	RIGGS-VISTA	13.20	2.30	2.30	2.29	0.046	0.000	Yes	SWG	153	3	36	0.12	Level 0

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
1A.03 (Johnson Vista Switch)	1A-50/51	13.20	2.28	2.28	2.27	0.326	0.083	Yes	SWG	153	32	36	1.1	Level 0
1A.03.1 (Johnson Transformer Primary)	JOHNSON-VISTA	13.20	2.28	2.28	1.93	0.087	0.000	Yes	SWG	153	4	36	0.19	Level 0 (*N3)
1A.04 (Lakeside Vista Switch)	1A-50/51	13.20	2.26	2.26	2.25	0.329	0.083	Yes	SWG	153	32	36	1.1	Level 0
1A.04.1 (lakeside Transformer Primary)	LAKE VISTA	13.20	2.26	2.26	2.25	0.047	0.000	Yes	SWG	153	3	36	0.12	Level 0
1A01A.1 (Lee 480V Secondary)	LEE-FU-1	0.48	9.52	9.52	6.29	2	0.000	Yes	PNL	25	153	18	40	Dangerous! (*N9)
1A01A.1.1 (Lee 480V Switchgear Bus)	LEE-FU-1 (LEE 480V MAIN)	0.48	9.50	9.50	6.28	2	0.000	Yes	PNL	25	153	18	40	Dangerous! (*N5) (*N9)
1A01A.1.2 (Lee ATS N Feed)	EPP-1 Fdr	0.48	9.03	9.03	5.11	0.335	0.000	Yes	PNL	25	45	18	5.4	Level 2 (*N3)
1A01A.1.3 (Lee ATS Fdr)	EPP-1 Fdr	0.48	9.03	9.03	5.11	0.335	0.000	Yes	PNL	25	45	18	5.4	Level 2 (*N3)
1A01A.1.4 (EPP-1 Panel (MLO))	EPP-1 Fdr	0.48	8.81	8.81	5.00	0.335	0.000	Yes	PNL	25	44	18	5.3	Level 2 (*N3)
1A01A.1.4.1 (PP-4 (MLO))	PP-4 Fdr	0.48	7.83	7.83	5.32	0.013	0.000	Yes	PNL	25	6	18	0.22	Level 0
1A01A.1.4.2 (EPL-1 Xfmr Primary)	EPL-1 Fdr	0.48	8.68	8.68	5.81	0.013	0.000	Yes	PNL	25	7	18	0.23	Level 0

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
1A01A.2 (LEE 208V Transformer Secondary)	LEE-FU-2	0.208	14.01	14.01	5.51	2	0.000	Yes	PNL	25	141	18	35	Level 4 (*N9)
1A01A1.4.2 (EPL-1 Xfmr Secondary)	EPL-1 Fdr	0.208	7.54	7.54	3.57	2	0.000	Yes	PNL	25	106	18	22	Level 3 (*N9)
1A01A1.4.3 (EPL-1 Main)	EPL-1 Fdr	0.208	7.44	7.44	3.54	2	0.000	Yes	PNL	25	105	18	22	Level 3 (*N9)
1A02.1 (Riggs Transformer Secondary)	RIGGS-VISTA	0.208	20.09	20.09	7.10	2	0.000	Yes	PNL	25	166	18	46	Dangerous! (*N9)
1A03.1 (Johnson Transformer Secondary)	JOHNSON-VISTA	0.208	34.49	34.49	10.38	2	0.000	Yes	PNL	25	213	18	69	Dangerous! (*N9)
1A04.1 (Lakeside Transformer Secondary)	LAKE VISTA	0.208	23.26	23.26	7.87	2	0.000	Yes	PNL	25	178	18	51	Dangerous! (*N9)
1B.01 (Waterbury Vista Switch)	1B-50/51	13.20	2.30	2.30	2.29	0.323	0.083	Yes	SWG	153	32	36	1.1	Level 0
1B.01.1 (Waterbury Transdormer Primary)	WATER-VISTA	13.20	2.30	2.30	2.29	0.041	0.000	Yes	SWG	153	2	36	0.11	Level 0
1B.02 (Scales Vista Switch)	1B-50/51	13.20	2.25	2.25	2.24	0.331	0.083	Yes	SWG	153	32	36	1.1	Level 0
1B.02.1 (Scales Transformer Primary)	SCALES-VISTA	13.20	2.25	2.25	2.24	0.041	0.000	Yes	SWG	153	2	36	0.10	Level 0
1B.03 (Walker Vista Switch)	1B-50/51	13.20	2.23	2.23	2.23	0.334	0.083	Yes	SWG	153	32	36	1.1	Level 0

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
1B.03.1 (Walker Transformer Primary)	WALKER-VISTA	13.20	2.23	2.23	2.23	0.041	0.000	Yes	SWG	153	2	36	0.10	Level 0
1B01.1 (Waterbury Transformer Secondary)	WATER-VISTA	0.208	10.19	10.19	4.41	2	0.000	Yes	PNL	25	121	18	27	Level 4 (*N9)
1B02.1 (Scales Transformer Secondary)	SCALES-VISTA	0.208	10.21	10.21	4.41	2	0.000	Yes	PNL	25	121	18	27	Level 4 (*N9)
1B03.1 (Walket Transformer Secondary)	WALKER-VISTA	0.208	10.22	10.22	4.42	2	0.000	Yes	PNL	25	122	18	27	Level 4 (*N9)
2A.01 (Swetman Vista Switch)	2A-50/51	13.20	2.34	2.34	2.33	0.317	0.083	Yes	SWG	153	32	36	1.1	Level 0
2A.01.1 (Campus Center Transformer Primary)	SWETMAN-VISTA	13.20	2.34	2.34	2.33	0.056	0.000	Yes	SWG	153	3	36	0.15	Level 0
2A.02 (SNYGG Vista Switch)	2A-50/51	13.20	2.29	2.29	2.27	0.325	0.083	Yes	SWG	153	32	36	1.1	Level 0
2A.02.1 (SNYGG Transformer Primary)	SNYGG-VISTA	13.20	2.29	2.29	1.93	0.086	0.000	Yes	SWG	153	4	36	0.19	Level 0 (*N3)
2A.03 (Wilber Vista Switch)	2A-50/51	13.20	2.25	2.25	2.24	0.33	0.083	Yes	SWG	153	32	36	1.1	Level 0
2A.03.1 (Wilber Transformer Primary)	WILBER-VISTA	13.20	2.25	2.25	2.24	0.058	0.000	Yes	SWG	153	3	36	0.15	Level 0
2A01.1 (Campus Center Transformer Secondary)	SWETMAN-VISTA	0.208	28.76	28.76	9.13	2	0.000	Yes	PNL	25	196	18	60	Dangerous! (*N9)

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
2A02.1 (SNYGG Transformer Secondary)	SNYGG-VISTA	0.208	36.22	36.22	10.74	2	0.000	Yes	PNL	25	218	18	72	Dangerous! (*N9)
2A03.1 (Wilber Transformer Secondary)	WILBER-VISTA	0.208	28.62	28.62	9.10	2	0.000	Yes	PNL	25	196	18	60	Dangerous! (*N9)
2C.01 (Service Building Vista Switch)	2C-50/51	13.20	3.07	3.07	3.04	0.242	0.083	Yes	SWG	153	35	36	1.2	Level 0
2C.01.1 (Service Building Transformer Primary)	SERV B-VISTA	13.20	3.07	3.07	3.04	0.04	0.000	Yes	SWG	153	3	36	0.14	Level 0
2C.02 (Mackin Vista Switch)	2C-50/51	13.20	3.03	3.03	3.01	0.246	0.083	Yes	SWG	153	35	36	1.2	Level 0
2C.02.1 (Mackin Transformer Primary)	MACKIN-VISTA	13.20	3.03	3.03	3.01	0.04	0.000	Yes	SWG	153	3	36	0.14	Level 0
2C.03 (Rich Vista Switch)	2C-50/51	13.20	2.98	2.98	2.96	0.25	0.083	Yes	SWG	153	35	36	1.1	Level 0
2C.03.1 (Rich 480V Transformer Primary)	RICH-VISTA-2	13.20	2.98	2.98	2.96	0.044	0.000	Yes	SWG	153	3	36	0.15	Level 0
2C.03.2 (Rich 208V Transformer Primary)	RICH-VISTA-1	13.20	2.98	2.98	2.96	0.04	0.000	Yes	SWG	153	3	36	0.14	Level 0
2C.04 (Park G&W Switch)	2C-50/51	13.20	2.89	2.89	2.87	0.258	0.083	Yes	SWG	153	34	36	1.1	Level 0
2C.04.1 (Park Transformer Primary)	PARK-G&W	13.20	2.89	2.89	2.87	0.06	0.083	Yes	SWG	153	14	36	0.48	Level 0

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
2C01.1 (Service Building Transformer Secondary)	SERV B-VISTA	0.208	5.77	5.77	2.96	2	0.000	Yes	PNL	25	93	18	18	Level 3 (*N9)
2C02.1 (Mackin Transformer Secondary)	MACKIN-VISTA	0.208	14.11	14.11	5.54	2	0.000	Yes	PNL	25	141	18	35	Level 4 (*N9)
2C03.1 (Rich 480V Transformer Secondary)	RICH-VISTA-2	0.48	9.62	9.62	5.39	1.955	0.000	Yes	PNL	25	137	18	33	Level 4 (*N3)
2C03.2 (Rich 208V Transformer Secondary)	RICH-VISTA-1	0.208	14.16	14.16	5.55	2	0.000	Yes	PNL	25	141	18	35	Level 4 (*N9)
2C04.1 (Park Transformer Secondary)	PARK-G&W	0.208	29.50	29.50	7.90	1.424	0.083	Yes	PNL	25	150	18	39	Level 4 (*N3)
3B.01 (Convocation Center Vista Switch)	3B-50/51	13.20	2.29	2.29	2.28	0.324	0.083	Yes	SWG	153	32	36	1.1	Level 0
3B.01.1 (Convocation Transformer Primary)	CONVO-VISTA	13.20	2.29	2.29	1.94	0.086	0.000	Yes	SWG	153	4	36	0.19	Level 0 (*N3)
3B.02 (Penfield Vista Switch)	3B-50/51	13.20	2.28	2.28	2.27	0.327	0.083	Yes	SWG	153	32	36	1.1	Level 0
3B.02.1 (Penfield Transformer Primary)	PEN VISTA	13.20	2.28	2.28	1.93	0.16	0.000	Yes	SWG	153	10	36	0.35	Level 0 (*N3)
3B.03 (Lanigan Vista Switch)	3B-50/51	13.20	2.26	2.26	2.25	0.33	0.083	Yes	SWG	153	32	36	1.1	Level 0
3B.03.1 (Lanigan Transformer Primary)	LAN-VISTA	13.20	2.26	2.26	1.91	0.088	0.000	Yes	SWG	153	4	36	0.19	Level 0 (*N3)

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
3B.04 (Mahar Vista Switch)	3B-50/51	13.20	2.21	2.21	2.20	0.338	0.083	Yes	SWG	153	32	36	1.1	Level 0
3B.04.1 (Mahar Transformer Primary)	MAHAR-VISTA	13.20	2.21	2.21	2.20	0.059	0.000	Yes	SWG	153	3	36	0.15	Level 0
3B01.1 (Convocation Transformer Secondary)	CONVO-VISTA	0.48	16.58	16.58	10.10	1.689	0.000	Yes	PNL	25	189	18	57	Dangerous!
3B02.1 (Penfield Transformer Secondary)	PEN VISTA	0.48	26.28	26.28	14.97	2	0.000	Yes	PNL	25	272	18	103	Dangerous! (*N9)
3B03.1 (Lanigan Transformer Secondary)	LAN-VISTA	0.208	38.27	38.27	11.16	2	0.000	Yes	PNL	25	224	18	75	Dangerous! (*N9)
3B04.1 (Mahar Transformer Secondary)	MAHAR-VISTA	0.208	30.60	30.60	9.54	2	0.000	Yes	PNL	25	202	18	63	Dangerous! (*N9)
3C.01 (Funnell Vista Switch)	3C-50/51	13.20	3.07	3.07	3.04	0.243	0.083	Yes	SWG	153	35	36	1.2	Level 0
3C.01.1 (Funnell Transformer Primary)	FUNNELLE-VISTA	13.20	3.07	3.07	3.04	0.04	0.000	Yes	SWG	153	3	36	0.14	Level 0
3C.02 (Cooper Vista Switch)	3C-50/51	13.20	2.98	2.98	2.95	0.251	0.083	Yes	SWG	153	34	36	1.1	Level 0
3C.02.1 (Cooper Transformer Primary)	COOPER-VISTA	13.20	2.98	2.98	2.95	0.044	0.000	Yes	SWG	153	3	36	0.15	Level 0
3C.03 (Hart Vista Switch)	3C-50/51	13.20	2.95	2.95	2.92	0.253	0.083	Yes	SWG	153	34	36	1.1	Level 0

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
3C.03.1 (Hart Transformer Primary)	HART-VISTA	13.20	2.95	2.95	2.92	0.04	0.000	Yes	SWG	153	3	36	0.14	Level 0
3C.04 (Culkin Vista Switch)	3C-50/51	13.20	2.85	2.85	2.83	0.262	0.083	Yes	SWG	153	34	36	1.1	Level 0
3C.04.1 (Culkin Transformer Primary)	CULKIN-VISTA	13.20	2.85	2.85	2.40	0.114	0.000	Yes	SWG	153	9	36	0.31	Level 0 (*N3)
3C01.1 (Funnell Transformer Secondary)	FUNNELLE-VISTA	0.208	14.00	14.00	5.51	2	0.000	Yes	PNL	25	141	18	35	Level 4 (*N9)
3C02.1 (Cooper Transformer Secondary)	COOPER-VISTA	0.208	22.45	22.45	7.67	2	0.000	Yes	PNL	25	175	18	50	Dangerous! (*N9)
3C03.1 (Hart Transformer Secondary)	HART-VISTA	0.208	14.13	14.13	5.54	2	0.000	Yes	PNL	25	141	18	35	Level 4 (*N9)
3C04.1 (Culkin Transformer Secondary)	CULKIN-VISTA	0.48	28.83	28.83	16.20	1.941	0.000	Yes	PNL	25	281	18	109	Dangerous!
4B.01 (Onondaga Vista Switch)	4B-50/51	13.20	2.18	2.18	2.17	0.344	0.083	Yes	SWG	153	32	36	1.1	Level 0
4B.01.1 (Onondaga Transformer Primary)	ONON-VISTA	13.20	2.18	2.18	2.17	0.06	0.000	Yes	SWG	153	3	36	0.15	Level 0
4B.02 (Oneida Vista Switch)	4B-50/51	13.20	2.13	2.13	2.13	0.352	0.083	Yes	SWG	153	32	36	1.0	Level 0
4B.02.1 (Oneida Transformer Primary)	ONEIDA-VISTA	13.20	2.13	2.13	2.13	0.042	0.000	Yes	SWG	153	2	36	0.10	Level 0

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
4B.04 (Little Page Vista Switch)	4B-50/51	13.20	2.11	2.11	2.10	0.357	0.083	Yes	SWG	153	31	36	1.0	Level 0
4B.04.1 (Little Page Transformer Primary)	L PAGE-VISTA	13.20	2.11	2.11	2.10	0.042	0.000	Yes	SWG	153	2	36	0.10	Level 0
4B.05 (Cayuga Vista Switch)	4B-50/51	13.20	2.08	2.08	2.07	0.364	0.083	Yes	SWG	153	31	36	1.0	Level 0
4B.05.1 (Cayuga Transformer Primary)	CAYUGA-VISTA	13.20	2.08	2.08	2.07	0.042	0.000	Yes	SWG	153	2	36	0.10	Level 0
4B01.1 (Onondaga Transformer Secondary)	ONON-VISTA	0.208	30.51	30.51	9.52	2	0.000	Yes	PNL	25	202	18	63	Dangerous! (*N9)
4B02.1 (Onieda Transformer Secondary)	ONEIDA-VISTA	0.208	14.04	14.04	5.52	2	0.000	Yes	PNL	25	141	18	35	Level 4 (*N9)
4B04.1 (Little Page Transformer Secondary)	L PAGE-VISTA	0.208	14.02	14.02	5.52	2	0.000	Yes	PNL	25	141	18	35	Level 4 (*N9)
4B05.1 (Cayuga Transformer Secondary)	CAYUGA-VISTA	0.208	14.00	14.00	5.51	2	0.000	Yes	PNL	25	141	18	35	Level 4 (*N9)
4C.01.0 (Hewitt Union Vista Switch)	4C-50/51	13.20	3.06	3.06	3.03	0.244	0.083	Yes	SWG	153	35	36	1.2	Level 0
4C.01.1 (Hewitt 208V Transformer Primary)	HEW-VISTA 1	13.20	3.06	3.06	3.03	0.055	0.000	Yes	SWG	153	4	36	0.19	Level 0
4C.01.2 (Hewitt 480V Transformer Primary)	HEW-VISTA 2	13.20	3.06	3.06	3.03	0.049	0.000	Yes	SWG	153	4	36	0.17	Level 0

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
4C.02 (Tyler Vista Switch)	4C-50/51	13.20	3.00	3.00	2.97	0.249	0.083	Yes	SWG	153	35	36	1.1	Level 0
4C.02.1 (Tyler 208V Transformer Primary)	TY-1-VISTA	13.20	3.00	3.00	2.97	0.056	0.000	Yes	SWG	153	4	36	0.19	Level 0
4C.02.2 (Tyler 480V Transformer Primary)	TY-2-VISTA	13.20	3.00	3.00	2.97	0.04	0.000	Yes	SWG	153	3	36	0.14	Level 0
4C.03 (Seneca Vista Switch)	4C-50/51	13.20	2.92	2.92	2.90	0.255	0.083	Yes	SWG	153	34	36	1.1	Level 0
4C.03.1 (Seneca Transformer Primary)	SEN-VISTA	13.20	2.92	2.92	2.90	0.05	0.000	Yes	SWG	153	4	36	0.17	Level 0
4C.04 (Pathfinder Vista Switch)	4C-50/51	13.20	2.91	2.91	2.89	0.256	0.083	Yes	SWG	153	34	36	1.1	Level 0
4C.04.1 (Pathfinder Transformer Primary)	PATH-VISTA	13.20	2.91	2.91	2.89	0.04	0.000	Yes	SWG	153	3	36	0.14	Level 0
4C01.1 (Hewitt 208V Transformer Secondary)	HEW-VISTA 1	0.208	41.15	41.15	11.75	2	0.000	Yes	PNL	25	231	18	79	Dangerous! (*N9)
4C01.2 (Hewitt 480V Transformer Secondary)	HEW-VISTA 2	0.48	9.97	9.97	6.54	2	0.000	Yes	PNL	25	157	18	42	Dangerous! (*N9)
4C02.1 (Tyler 208V Transformer Secondary)	TY-1-VISTA	0.208	40.98	40.98	11.71	2	0.000	Yes	PNL	25	231	18	79	Dangerous! (*N9)
4C02.2 (Tyler 480V Transformer Secondary)	TY-2-VISTA	0.48	4.79	4.79	2.97	1.973	0.000	Yes	PNL	25	93	18	18	Level 3 (*N3)

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
4C03.1 (Seneca Transformer Secondary)	SEN-VISTA	0.208	32.34	32.34	9.92	2	0.000	Yes	PNL	25	207	18	66	Dangerous! (*N9)
4C04.1 (Pathfinder Transformer Secondary)	PATH-VISTA	0.208	14.44	14.44	5.63	2	0.000	Yes	PNL	25	143	18	36	Level 4 (*N9)
5C.01 (Piez Hall G&W Switch)	5C-50/51	13.20	3.28	3.28	3.24	0.225	0.083	Yes	SWG	153	35	36	1.2	Level 0
5C.01.1 (1-TN-1 Xfmr Pri)	PIEZ G&W 1	13.20	3.27	3.27	3.24	0.06	0.083	Yes	SWG	153	16	36	0.54	Level 0
5C.01.2 (L-TN-3 Xfmr Pri)	PIEZ G&W 2	13.20	3.28	3.28	3.24	0.06	0.083	Yes	SWG	153	16	36	0.55	Level 0
5C01.1 (1-TN-1 Xfmr Sec)	PIEZ G&W 1	0.48	23.57	23.57	11.59	0.975	0.083	Yes	PNL	25	156	18	41	Dangerous! (*N3)
5C01.1.2 (1-SWBDN-1 Main)	PIEZ G&W 1	0.48	23.44	23.44	11.54	0.985	0.083	Yes	PNL	25	156	18	41	Dangerous! (*N3)
5C01.2 (L-TN-3 Xfmr Sec)	PIEZ G&W 2	0.48	33.28	33.28	15.57	0.893	0.083	Yes	PNL	25	180	18	52	Dangerous! (*N3)
5C012.1 (1-SWBDN-1 Main)	PIEZ G&W 2	0.48	33.03	33.03	15.47	0.904	0.083	Yes	PNL	25	181	18	53	Dangerous! (*N3)
G01 (Lee Generator)	MaxTripTime @2.0s	0.48	4.00	4.00	3.00	2	0.000	Yes	PNL	25	94	18	18	Level 3 (*N2) (*N9)
G01.1 (Lee Standby Breaker)	MaxTripTime @2.0s	0.48	3.96	3.96	2.97	2	0.000	Yes	PNL	25	94	18	18	Level 3 (*N2) (*N9)

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
G01.1.2 (Lee ATS E Feed)	Standby Bkr	0.48	3.66	3.66	2.78	2	0.000	Yes	PNL	25	90	18	17	Level 3 (*N9)
G01.2 (Lee Portable Load Bank Breaker)	MaxTripTime @2.0s	0.48	3.96	3.96	2.97	2	0.000	Yes	PNL	25	94	18	18	Level 3 (*N2) (*N9)
Level 0: Nonmelting or Untreated Fiber with Weight >= 4.5 oz/sq yd	0.0 - 1.2 cal/cm^2												#Level 0 = 70 #Level 1 = 6 #Level 2 = 9 #Level 3 = 12 #Level 4 = 14 #Danger = 23 #Equip Eval Failed = 0	(*N11) - Out of IEEE 1584 Range, Lee Equation Used. Applicable for Open Air only. Existing Equipment type is not Open Air! (*N2) < 80% Cleared Fault Threshold (*N3) - Arcing Current Low Tolerances Used (*N5) - Miscoordinated, Upstream Device Tripped (*N9) - Max Arcing Duration Reached
Level 1: Arc-rated shirt & pants or arc-rated coverall	1.2 - 4.0 cal/cm^2													
Level 2: Arc-rated shirt & pants or arc-rated coverall	4.0 - 8.0 cal/cm^2													
Level 3: Arc-rated shirt & pants + arc-rated coverall + arc-rated arc flash suit	8.0 - 25.0 cal/cm^2													
Level 4: Arc-rated shirt & pants + arc-rated coverall + arc-rated arc flash suit	25.0 - 40.0 cal/cm^2													
Level Dangerous!: DO NOT WORK ON LIVE!	40.0 - 999.0 cal/cm^2													

SUNY OSWEGO
ARC FLASH TABULATION - NORMAL SYSTEM

Bus Name	Protective Device Name	Bus kV	Bus Bolted Fault (kA)	Prot Dev Bolted Fault (kA)	Prot Dev Arcing Fault (kA)	Trip/ Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Ground	Equip Type	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level
For additional information refer to NFPA 70 E, Standard for Electrical Safety in the Workplace.	Device with 80% Cleared Fault Threshold												NFPA 70E 2012 Annex D.7 - IEEE 1584 Bus Report (80% Cleared Fault Threshold, include Ind. Motors for 60000.0 Cycles), mis-coordination checked	

Level 0: Nonmelting or Untreated Fiber with Weight >= 4.5 oz/sq yd, Safety Glasses or Goggles + Ear Canal Inserts, Leather Gloves, Safety glasses, Non-melting or untreated natural fiber (cotton/wool/rayon/silk > 4.5 oz/sq yd), shirt (long-sleeve), pants (long)., > 50V voltage rated tools + Class 0 (minimum) gloves, Dielectric shoes or insulating mat (step and touch potential).

Level 1: Arc-rated shirt & pants or arc-rated coverall , Hardhat + Arc-rated hard hat liner + Safety Glasses or Goggles + Ear Canal Inserts, Leather Gloves, Leather work shoes, Safety glasses, electrically rated hard hat with hood and face shield., 4 cal/sq cm, Arc-rated shirt (long-sleeve) plus Arc-rated pants (long), or Arc-rated coverall, plus arc-rated face shield or arc flash suit hood, Arc-rated rainwear as needed., > 50V voltage rated tools + Class 0 (minimum) gloves and leather protectors (flash) as needed., Leather shoes (flash) as needed. Dielectric shoes or insulating mat (step and touch potential).

Level 2: Arc-rated shirt & pants or arc-rated coverall , Hardhat + Arc-rated hard hat liner + Safety Glasses or Goggles + Ear Canal Inserts, Leather Gloves, Leather work shoes, Safety glasses, electrically rated hard hat with hood and face shield. Hearing protection., 8 cal/sq cm, Arc-rated shirt (long-sleeve) plus Arc-rated pants (long), or Arc-rated coverall, plus arc-rated flash suit hood or arc-rated face shield and arc rated balaclava, Arc-rated rainwear as needed., > 50V voltage rated tools + Class 0 (minimum) gloves and leather protectors (flash)., Leather shoes (flash) as needed. Dielectric shoes or insulating mat (step and touch potential).

Level 3: Arc-rated shirt & pants + arc-rated coverall + arc-rated arc flash suit , Hardhat + Arc-rated hard hat liner + Safety Glasses or Goggles + Ear Canal Inserts, Arc-rated Gloves, Leather work shoes, Safety glasses, electrically rated hard hat with hood and face shield. Hearing protection., 25 cal/sq cm, Arc-rated shirt (long-sleeve) plus Arc-rated pants (long) plus Arc-rated coverall, plus arc rated arc flash suit jacket, pants, & hood, Arc-rated rainwear as needed., > 50V voltage rated tools + Class 0 (minimum) gloves and leather protectors (flash)., Leather shoes (flash) as needed. Dielectric shoes or insulating mat (step and touch potential).

Level 4: Arc-rated shirt & pants + arc-rated coverall + arc-rated arc flash suit , Hardhat + Arc-rated hard hat liner + Safety Glasses or Goggles + Ear Canal Inserts, Arc-rated Gloves, Leather work shoes, Safety glasses, electrically rated hard hat with hood and face shield. Hearing protection., 40 cal/sq cm, Arc-rated shirt (long-sleeve) plus Arc-rated pants (long) plus Arc-rated coverall, plus arc rated arc flash suit jacket, pants, & hood, Arc-rated rainwear as needed., > 50V voltage rated tools + Class 0 (minimum) gloves and leather protectors (flash)., Leather shoes (flash) as needed. Dielectric shoes or insulating mat (step and touch potential).

Level Dangerous!: DO NOT WORK ON LIVE!, DO NOT WORK ON LIVE!, DO NOT WORK ON LIVE!, DO NOT WORK ON LIVE!, DO NOT WORK ON LIVE!, No FR Category Found

6.0 SHORT CIRCUIT REPORT

Jun 24, 2013 14:10:49

ALL INFORMATION PRESENTED IS FOR REVIEW, APPROVAL
INTERPRETATION AND APPLICATION BY A REGISTERED ENGINEER ONLY
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FROM THE USE AND INTERPRETATION OF THIS SOFTWARE.

SKM POWER*TOOLS FOR WINDOWS
A_FAULT SHORT CIRCUIT ANALYSIS REPORT

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

1A01A.1 3P Duty: 9.522 KA AT -78.71 DEG (7.92 MVA) X/R: 5.01
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0057 + J 0.0285 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 9.522 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 10.644 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 9.568 KA
LEE 480 1A.01A.1 9.522 KA ANG: 101.29

1A01A.1.1 3P Duty: 9.501 KA AT -78.55 DEG (7.90 MVA) X/R: 4.94
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0058 + J 0.0286 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 9.501 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 10.587 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 9.517 KA
CBL-0288 1A01A.1 9.501 KA ANG: -78.55

1A01A.1.2 3P Duty: 9.031 KA AT -77.65 DEG (7.51 MVA) X/R: 4.57
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0066 + J 0.0300 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 9.031 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 9.889 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 9.031 KA
CBL-0287 1A01A.1.1 9.031 KA ANG: 102.35

1A01A.1.3 3P Duty: 9.031 KA AT -77.65 DEG (7.51 MVA) X/R: 4.57
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0066 + J 0.0300 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 9.031 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 9.889 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 9.031 KA
AUTO-0011 1A01A.1.2 9.031 KA ANG: -257.65

1A01A.1.4 3P Duty: 8.812 KA AT -77.24 DEG (7.33 MVA) X/R: 4.41
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0069 + J 0.0307 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 8.812 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 9.573 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 8.812 KA
CBL-0281 1A01A.1.3 8.812 KA ANG: 102.76

1A01A.1.4.1 3P Duty: 7.828 KA AT -74.41 DEG (6.51 MVA) X/R: 3.58
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0095 + J 0.0341 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 7.828 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 9.531 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 8.077 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 7.828 KA
CBL-0291 1A01A.1.4 7.828 KA ANG: -74.41

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

1A01A.1.4.2 3P Duty: 8.682 KA AT -76.57 DEG (7.22 MVA) X/R: 4.19
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0074 + J 0.0310 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 8.682 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 9.315 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 8.682 KA
CBL-0290 1A01A.1.4 8.682 KA ANG: -76.57

1A01A.2 3P Duty: 14.014 KA AT -77.06 DEG (5.05 MVA) X/R: 4.35
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0019 + J 0.0084 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 14.014 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 15.173 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 14.014 KA
LEE 208 1A.01A.2 14.014 KA ANG: 102.94

1A01A1.4.2 3P Duty: 7.536 KA AT -75.97 DEG (2.72 MVA) X/R: 4.00
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0039 + J 0.0155 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 7.536 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 9.435 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 7.996 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 7.536 KA
EPL-1 Xfmr 1A01A.1.4.2 7.536 KA ANG: 104.03

1A01A1.4.3 3P Duty: 7.444 KA AT -75.67 DEG (2.68 MVA) X/R: 3.92
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0040 + J 0.0156 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 7.444 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 9.270 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 7.856 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 7.444 KA
CBL-0292 1A01A1.4.2 7.444 KA ANG: -75.67

1A02.1 3P Duty: 20.088 KA AT -78.10 DEG (7.24 MVA) X/R: 4.74
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0012 + J 0.0058 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 20.088 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 20.088 KA
RIGGS XFMR 1A.02.1 20.088 KA ANG: -258.10

1A03.1 3P Duty: 34.486 KA AT -79.55 DEG (12.42 MVA) X/R: 5.42
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0006 + J 0.0034 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 34.486 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 35.243 KA
JOHNS XFMR 1A.03.1 34.486 KA ANG: -259.55

1A04.1 3P Duty: 23.261 KA AT -77.87 DEG (8.38 MVA) X/R: 4.65

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0011 + J 0.0050 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 23.261 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 23.261 KA
LAKE XFMR 1A.04.1 23.261 KA ANG: 102.13

1B01.1 3P Duty: 10.194 KA AT -75.83 DEG (3.67 MVA) X/R: 3.96
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0029 + J 0.0114 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 10.194 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 10.788 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 10.194 KA
WATER XFMR 1B.01.1 10.194 KA ANG: 104.17

1B02.1 3P Duty: 10.210 KA AT -75.70 DEG (3.68 MVA) X/R: 3.92
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0029 + J 0.0114 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 10.210 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 10.781 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 10.210 KA
SCALES XFMR 1B.02.1 10.210 KA ANG: 104.30

1B03.1 3P Duty: 10.221 KA AT -75.65 DEG (3.68 MVA) X/R: 3.91
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0029 + J 0.0114 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 10.221 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 10.783 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 10.221 KA
WALKER XFMR 1B.03.1 10.221 KA ANG: 104.35

2A01.1 3P Duty: 28.757 KA AT -79.44 DEG (10.36 MVA) X/R: 5.36
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0008 + J 0.0041 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 28.757 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 29.323 KA
CAMP CENT XFMR 2A.01.1 28.757 KA ANG: 100.56

2A02.1 3P Duty: 36.223 KA AT -79.59 DEG (13.05 MVA) X/R: 5.44
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0006 + J 0.0033 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 36.223 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 37.051 KA
SNYGG XFMR 2A.02.1 36.223 KA ANG: 100.41

2A03.1 3P Duty: 28.618 KA AT -78.75 DEG (10.31 MVA) X/R: 5.03
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0008 + J 0.0041 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 28.618 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 28.784 KA
WILBER XFMR 2A.03.1 28.618 KA ANG: 101.25

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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2C01.1 3P Duty: 5.772 KA AT -73.66 DEG (2.08 MVA) X/R: 3.41
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0059 + J 0.0200 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 5.772 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 6.938 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 5.880 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 5.772 KA
SERV XFMR 2C.01.1 5.772 KA ANG: 106.34

2C02.1 3P Duty: 14.108 KA AT -76.35 DEG (5.08 MVA) X/R: 4.12
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0020 + J 0.0083 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 14.108 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 15.073 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 14.108 KA
MACKIN XFMR 2C.02.1 14.108 KA ANG: 103.65

2C03.1 3P Duty: 9.621 KA AT -77.48 DEG (8.00 MVA) X/R: 4.50
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0062 + J 0.0281 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 9.621 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 10.501 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 9.621 KA
RICH 2 XFMR 2C.03.1 9.621 KA ANG: 102.52

2C03.2 3P Duty: 14.164 KA AT -76.25 DEG (5.10 MVA) X/R: 4.09
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0020 + J 0.0082 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 14.164 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 15.107 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 14.164 KA
RICH 1 XFMR 2C.03.2 14.164 KA ANG: -256.25

2C04.1 3P Duty: 29.504 KA AT -77.97 DEG (10.63 MVA) X/R: 4.69
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0008 + J 0.0040 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 29.504 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 29.504 KA
PARK XFMR 2C.04.1 29.504 KA ANG: 102.03

3B01.1 3P Duty: 16.576 KA AT -79.65 DEG (13.78 MVA) X/R: 5.48
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0030 + J 0.0164 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 16.576 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 18.884 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 16.976 KA
CONVOCATION 3B.01.1 16.576 KA ANG: 100.35

3B02.1 3P Duty: 26.280 KA AT -80.76 DEG (21.85 MVA) X/R: 6.14

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

	VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0017 + J 0.0104 OHMS			
	LOW VOLTAGE POWER CIRCUIT BREAKER 26.280 KA			
	MOLDED CASE CIRCUIT BREAKER > 20KA 27.539 KA			
	PEN XFMR	3B.02.1	26.280 KA	ANG: -260.76
3B03.1	3P Duty: 38.268 KA AT -79.64 DEG (13.79 MVA) X/R: 5.47			
	VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0006 + J 0.0031 OHMS			
	LOW VOLTAGE POWER CIRCUIT BREAKER 38.268 KA			
	MOLDED CASE CIRCUIT BREAKER > 20KA 39.184 KA			
	LAN XFMR	3B.03.1	38.268 KA	ANG: 100.36
3B04.1	3P Duty: 30.600 KA AT -77.96 DEG (11.02 MVA) X/R: 4.69			
	VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0008 + J 0.0038 OHMS			
	LOW VOLTAGE POWER CIRCUIT BREAKER 30.600 KA			
	MOLDED CASE CIRCUIT BREAKER > 20KA 30.600 KA			
	MAHAR XFMR	3B.04.1	30.600 KA	ANG: 102.04
3C01.1	3P Duty: 14.001 KA AT -76.41 DEG (5.04 MVA) X/R: 4.14			
	VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0020 + J 0.0083 OHMS			
	LOW VOLTAGE POWER CIRCUIT BREAKER 14.001 KA			
	MOLDED CASE CIRCUIT BREAKER < 20KA 14.977 KA			
	MOLDED CASE CIRCUIT BREAKER > 20KA 14.001 KA			
	FUNNELL XFMR	3C.01.1	14.001 KA	ANG: -256.41
3C02.1	3P Duty: 22.446 KA AT -77.45 DEG (8.09 MVA) X/R: 4.49			
	VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0012 + J 0.0052 OHMS			
	LOW VOLTAGE POWER CIRCUIT BREAKER 22.446 KA			
	MOLDED CASE CIRCUIT BREAKER > 20KA 22.446 KA			
	COOPER XFMR	3C.02.1	22.446 KA	ANG: 102.55
3C03.1	3P Duty: 14.128 KA AT -76.19 DEG (5.09 MVA) X/R: 4.07			
	VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0020 + J 0.0083 OHMS			
	LOW VOLTAGE POWER CIRCUIT BREAKER 14.128 KA			
	MOLDED CASE CIRCUIT BREAKER < 20KA 15.050 KA			
	MOLDED CASE CIRCUIT BREAKER > 20KA 14.128 KA			
	HART XFMR	3C.03.1	14.128 KA	ANG: 103.81
3C04.1	3P Duty: 28.829 KA AT -78.38 DEG (23.97 MVA) X/R: 4.86			
	VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0019 + J 0.0094 OHMS			
	LOW VOLTAGE POWER CIRCUIT BREAKER 28.829 KA			
	MOLDED CASE CIRCUIT BREAKER > 20KA 28.829 KA			
	CULK XFMR	3C.04.1	28.829 KA	ANG: -258.38
4B01.1	3P Duty: 30.509 KA AT -77.71 DEG (10.99 MVA) X/R: 4.59			

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0008 + J  0.0038  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   30.509 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  30.509 KA
                ONON XFMR       4B.01.1           30.509 KA      ANG:  -257.71

 4B02.1         3P Duty: 14.035 KA AT  -76.99 DEG (   5.06 MVA)  X/R:     4.33
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0019 + J  0.0083  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   14.035 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  15.175 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  14.035 KA
                ONEIDA XFMR     4B.02.1           14.035 KA      ANG:   103.01

 4B04.1         3P Duty: 14.021 KA AT  -76.90 DEG (   5.05 MVA)  X/R:     4.30
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0019 + J  0.0083  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   14.021 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  15.137 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  14.021 KA
                LP XFMR         4B.04.1           14.021 KA      ANG:   103.10

 4B05.1         3P Duty: 14.000 KA AT  -76.78 DEG (   5.04 MVA)  X/R:     4.26
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0020 + J  0.0084  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   14.000 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  15.077 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  14.000 KA
                CAYUGA XFMR     4B.05.1           14.000 KA      ANG:   103.22

 4C01.1         3P Duty: 41.151 KA AT  -79.51 DEG (  14.83 MVA)  X/R:     5.40
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0005 + J  0.0029  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER   41.151 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA  42.023 KA
                HEW 1 XFMR      4C.01.1           41.151 KA      ANG:   100.49

 4C01.2         3P Duty:  9.966 KA AT  -77.26 DEG (   8.29 MVA)  X/R:     4.42
                VOLTAGE:    480.   EQUIV. IMPEDANCE=  0.0061 + J  0.0271  OHMS
                LOW VOLTAGE POWER CIRCUIT BREAKER    9.966 KA
                MOLDED CASE CIRCUIT BREAKER < 20KA  10.832 KA
                MOLDED CASE CIRCUIT BREAKER > 20KA   9.966 KA
                HEW 2 XFMR      4C.01.2            9.966 KA      ANG:  -257.26

 4C02.1         3P Duty: 40.983 KA AT  -79.14 DEG (  14.76 MVA)  X/R:     5.21
                VOLTAGE:    208.   EQUIV. IMPEDANCE=  0.0006 + J  0.0029  OHMS
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T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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LOW VOLTAGE POWER CIRCUIT BREAKER 40.983 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 41.538 KA
TY 1 XFMR 4C.02.1 40.983 KA ANG: 100.86

4C02.2 3P Duty: 4.791 KA AT -76.60 DEG (3.98 MVA) X/R: 4.20
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0134 + J 0.0563 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 4.791 KA
MOLDED CASE CIRCUIT BREAKER < 10KA 6.069 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 5.143 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 4.791 KA
TY-2 XFMR 4C.02.2 4.791 KA ANG: -256.60

4C03.1 3P Duty: 32.344 KA AT -77.58 DEG (11.65 MVA) X/R: 4.54
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0008 + J 0.0036 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 32.344 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 32.344 KA
SEN XFMR 4C.03.1 32.344 KA ANG: 102.42

4C04.1 3P Duty: 14.436 KA AT -77.05 DEG (5.20 MVA) X/R: 4.35
VOLTAGE: 208. EQUIV. IMPEDANCE= 0.0019 + J 0.0081 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 14.436 KA
MOLDED CASE CIRCUIT BREAKER < 20KA 15.626 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 14.436 KA
PATH XFMR 4C.04.1 14.436 KA ANG: -257.05

5C01.1 3P Duty: 23.569 KA AT -81.45 DEG (19.60 MVA) X/R: 6.65
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0017 + J 0.0116 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 23.606 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 25.063 KA
PIEZ 1 XFMR 5C.01.1 23.569 KA ANG: 98.55

5C01.1.2 3P Duty: 23.439 KA AT -81.04 DEG (19.49 MVA) X/R: 6.34
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0018 + J 0.0117 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 23.439 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 24.710 KA
CBL-048 5C01.1 23.439 KA ANG: -81.04

5C01.2 3P Duty: 33.279 KA AT -83.61 DEG (27.67 MVA) X/R: 8.92
VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0009 + J 0.0083 OHMS
LOW VOLTAGE POWER CIRCUIT BREAKER 34.971 KA
MOLDED CASE CIRCUIT BREAKER > 20KA 37.130 KA
PIEZ 2 XFMR 5C.01.2 33.279 KA ANG: 96.39

5C012.1 3P Duty: 33.032 KA AT -83.02 DEG (27.46 MVA) X/R: 8.17

T H R E E P H A S E F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

	VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0010 + J 0.0083 OHMS		
	LOW VOLTAGE POWER CIRCUIT BREAKER 34.252 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA 36.367 KA		
	CBL-049 5C01.2	33.032 KA	ANG: -83.02
G01	3P Duty: 4.004 KA AT -87.14 DEG (3.33 MVA) X/R: 20.00		
	VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0035 + J 0.0691 OHMS		
	LOW VOLTAGE POWER CIRCUIT BREAKER 4.582 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA 6.386 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA 5.412 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA 4.865 KA		
	CONTRIBUTIONS: Lee Gen	4.004 KA	ANG: -87.14
G01.1	3P Duty: 3.963 KA AT -86.85 DEG (3.30 MVA) X/R: 18.17		
	VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0038 + J 0.0698 OHMS		
	LOW VOLTAGE POWER CIRCUIT BREAKER 4.502 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA 6.275 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA 5.318 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA 4.780 KA		
	CBL-0283 G01	3.963 KA	ANG: -86.85
G01.1.2	3P Duty: 3.661 KA AT -84.75 DEG (3.04 MVA) X/R: 10.88		
	VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0069 + J 0.0754 OHMS		
	LOW VOLTAGE POWER CIRCUIT BREAKER 3.951 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA 5.507 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA 4.667 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA 4.195 KA		
	CBL-0282 G01.1	3.661 KA	ANG: 95.25
G01.2	3P Duty: 3.963 KA AT -86.85 DEG (3.30 MVA) X/R: 18.17		
	VOLTAGE: 480. EQUIV. IMPEDANCE= 0.0038 + J 0.0698 OHMS		
	LOW VOLTAGE POWER CIRCUIT BREAKER 4.502 KA		
	MOLDED CASE CIRCUIT BREAKER < 10KA 6.275 KA		
	MOLDED CASE CIRCUIT BREAKER < 20KA 5.318 KA		
	MOLDED CASE CIRCUIT BREAKER > 20KA 4.780 KA		
	CBL-0284 G01	3.963 KA	ANG: -86.85

U N B A L A N C E D F A U L T R E P O R T

(FOR APPLICATION OF LOW VOLTAGE BREAKERS)

PRE FAULT VOLTAGE: 1.0000

MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
1A01A.1	3P Duty:	9.522	5.	Z1= 12.6315	11.933	10.763
	SLG DUTY:	10.001	5.	Z2= 12.6315	12.476	
480. VOLTS	LN/LN:	8.247		Z0= 10.8200		
	LN/LN/GND:	9.819 (10.529 GND RETURN KA)				
1A01A.1.1	3P Duty:	9.501	5.	Z1= 12.6598	11.867	10.719
	SLG DUTY:	9.941	5.	Z2= 12.6598	12.292	
480. VOLTS	LN/LN:	8.228		Z0= 10.9805		
	LN/LN/GND:	9.821 (10.424 GND RETURN KA)				
1A01A.1.2	3P Duty:	9.031	5.	Z1= 13.3188	11.081	10.083
	SLG DUTY:	9.181	4.	Z2= 13.3188	11.008	
480. VOLTS	LN/LN:	7.821		Z0= 12.6839		
	LN/LN/GND:	9.283 (9.332 GND RETURN KA)				
1A01A.1.3	3P Duty:	9.031	5.	Z1= 13.3188	11.081	10.083
	SLG DUTY:	9.181	4.	Z2= 13.3188	11.008	
480. VOLTS	LN/LN:	7.821		Z0= 12.6840		
	LN/LN/GND:	9.283 (9.332 GND RETURN KA)				
1A01A.1.4	3P Duty:	8.812	4.	Z1= 13.6494	10.727	9.794
	SLG DUTY:	8.841	4.	Z2= 13.6494	10.467	
480. VOLTS	LN/LN:	7.632		Z0= 13.5471		
	LN/LN/GND:	9.033 (8.863 GND RETURN KA)				
1A01A.1.4.1	3P Duty:	7.828	4.	Z1= 15.3665	9.082	8.467
	SLG DUTY:	7.390	3.	Z2= 15.3665	8.201	
480. VOLTS	LN/LN:	6.779		Z0= 18.2393		
	LN/LN/GND:	7.958 (6.978 GND RETURN KA)				
1A01A.1.4.2	3P Duty:	8.682	4.	Z1= 13.8544	10.441	9.583
	SLG DUTY:	8.635	4.	Z2= 13.8544	10.040	
480. VOLTS	LN/LN:	7.519		Z0= 14.1302		
	LN/LN/GND:	8.915 (8.579 GND RETURN KA)				
1A01A.2	3P Duty:	14.014	4.	Z1= 19.8066	17.003	15.546
	SLG DUTY:	14.454	4.	Z2= 19.8066	17.475	
208. VOLTS	LN/LN:	12.137		Z0= 17.9999		
	LN/LN/GND:	14.290 (14.922 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T

(FOR APPLICATION OF LOW VOLTAGE BREAKERS)

PRE FAULT VOLTAGE: 1.0000

MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
1A01A1.4.2	3P Duty:	7.536	4.	Z1= 36.8308	8.968	8.268
	SLG DUTY:	8.617	4.	Z2= 36.8308	10.238	
208. VOLTS	LN/LN:	6.527		Z0= 22.9776		
	LN/LN/GND:	8.254 (10.059 GND RETURN KA)				
1A01A1.4.3	3P Duty:	7.444	4.	Z1= 37.2878	8.814	8.144
	SLG DUTY:	8.434	4.	Z2= 37.2878	9.920	
208. VOLTS	LN/LN:	6.447		Z0= 24.1651		
	LN/LN/GND:	8.138 (9.727 GND RETURN KA)				
1A02.1	3P Duty:	20.088	5.	Z1= 13.8180	24.863	22.542
	SLG DUTY:	21.052	5.	Z2= 13.8180	26.037	
208. VOLTS	LN/LN:	17.396		Z0= 11.9200		
	LN/LN/GND:	20.625 (22.113 GND RETURN KA)				
1A03.1	3P Duty:	34.486	5.	Z1= 8.0488	43.996	39.394
	SLG DUTY:	37.464	5.	Z2= 8.0488	47.945	
208. VOLTS	LN/LN:	29.866		Z0= 6.1300		
	LN/LN/GND:	36.133 (41.003 GND RETURN KA)				
1A04.1	3P Duty:	23.261	5.	Z1= 11.9331	28.659	26.034
	SLG DUTY:	24.588	5.	Z2= 11.9331	30.314	
208. VOLTS	LN/LN:	20.144		Z0= 10.0000		
	LN/LN/GND:	23.983 (26.077 GND RETURN KA)				
1B01.1	3P Duty:	10.194	4.	Z1= 27.2302	12.101	11.168
	SLG DUTY:	10.436	4.	Z2= 27.2302	12.373	
208. VOLTS	LN/LN:	8.828		Z0= 25.3334		
	LN/LN/GND:	10.332 (10.690 GND RETURN KA)				
1B02.1	3P Duty:	10.210	4.	Z1= 27.1851	12.095	11.173
	SLG DUTY:	10.459	4.	Z2= 27.1851	12.383	
208. VOLTS	LN/LN:	8.843		Z0= 25.2444		
	LN/LN/GND:	10.345 (10.721 GND RETURN KA)				
1B03.1	3P Duty:	10.221	4.	Z1= 27.1568	12.098	11.180
	SLG DUTY:	10.473	4.	Z2= 27.1568	12.392	
208. VOLTS	LN/LN:	8.852		Z0= 25.1998		
	LN/LN/GND:	10.355 (10.737 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
2A01.1	3P Duty:	28.757	5.	Z1= 9.6524	36.599	32.803
	SLG DUTY:	30.737	5.	Z2= 9.6524	39.060	
208. VOLTS	LN/LN:	24.904		Z0= 7.7867		
	LN/LN/GND:	29.913 (33.011 GND RETURN KA)				
2A02.1	3P Duty:	36.223	5.	Z1= 7.6629	46.255	41.401
	SLG DUTY:	39.511	6.	Z2= 7.6629	50.599	
208. VOLTS	LN/LN:	31.370		Z0= 5.7500		
	LN/LN/GND:	38.070 (43.455 GND RETURN KA)				
2A03.1	3P Duty:	28.618	5.	Z1= 9.6991	35.898	32.366
	SLG DUTY:	30.662	5.	Z2= 9.6991	38.562	
208. VOLTS	LN/LN:	24.784		Z0= 7.7600		
	LN/LN/GND:	29.714 (33.020 GND RETURN KA)				
2C01.1	3P Duty:	5.772	3.	Z1= 48.0878	6.624	6.206
	SLG DUTY:	5.830	3.	Z2= 48.0878	6.687	
208. VOLTS	LN/LN:	4.999		Z0= 46.6662		
	LN/LN/GND:	5.804 (5.888 GND RETURN KA)				
2C02.1	3P Duty:	14.108	4.	Z1= 19.6745	16.899	15.536
	SLG DUTY:	14.461	4.	Z2= 19.6745	17.332	
208. VOLTS	LN/LN:	12.218		Z0= 18.2334		
	LN/LN/GND:	14.285 (14.833 GND RETURN KA)				
2C03.1	3P Duty:	9.621	5.	Z1= 12.5020	11.767	10.722
	SLG DUTY:	10.011	5.	Z2= 12.5020	12.279	
480. VOLTS	LN/LN:	8.332		Z0= 11.0401		
	LN/LN/GND:	9.806 (10.434 GND RETURN KA)				
2C03.2	3P Duty:	14.164	4.	Z1= 19.5971	16.937	15.583
	SLG DUTY:	14.526	4.	Z2= 19.5971	17.389	
208. VOLTS	LN/LN:	12.266		Z0= 18.1333		
	LN/LN/GND:	14.339 (14.906 GND RETURN KA)				
2C04.1	3P Duty:	29.504	5.	Z1= 9.4079	36.424	33.060
	SLG DUTY:	31.163	5.	Z2= 9.4079	38.752	
208. VOLTS	LN/LN:	25.551		Z0= 7.9067		
	LN/LN/GND:	30.234 (33.018 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
3B01.1	3P Duty:	16.576	5.	Z1= 7.2563	21.195	18.960
	SLG DUTY:	18.167	6.	Z2= 7.2563	23.287	
480. VOLTS	LN/LN:	14.355		Z0= 5.3500		
	LN/LN/GND:	17.487 (20.096 GND RETURN KA)				
3B02.1	3P Duty:	26.280	6.	Z1= 4.5769	34.460	30.517
	SLG DUTY:	30.548	6.	Z2= 4.5769	40.515	
480. VOLTS	LN/LN:	22.759		Z0= 2.6600		
	LN/LN/GND:	28.878 (36.467 GND RETURN KA)				
3B03.1	3P Duty:	38.268	5.	Z1= 7.2534	48.922	43.768
	SLG DUTY:	42.001	6.	Z2= 7.2534	53.980	
208. VOLTS	LN/LN:	33.141		Z0= 5.3200		
	LN/LN/GND:	40.317 (46.539 GND RETURN KA)				
3B04.1	3P Duty:	30.600	5.	Z1= 9.0711	37.771	34.284
	SLG DUTY:	32.998	5.	Z2= 9.0711	40.898	
208. VOLTS	LN/LN:	26.500		Z0= 7.0933		
	LN/LN/GND:	31.865 (35.805 GND RETURN KA)				
3C01.1	3P Duty:	14.001	4.	Z1= 19.8252	16.790	15.428
	SLG DUTY:	14.345	4.	Z2= 19.8252	17.206	
208. VOLTS	LN/LN:	12.125		Z0= 18.4001		
	LN/LN/GND:	14.178 (14.706 GND RETURN KA)				
3C02.1	3P Duty:	22.446	4.	Z1= 12.3663	27.433	25.005
	SLG DUTY:	23.370	5.	Z2= 12.3663	28.650	
208. VOLTS	LN/LN:	19.439		Z0= 10.9000		
	LN/LN/GND:	22.882 (24.373 GND RETURN KA)				
3C03.1	3P Duty:	14.128	4.	Z1= 19.6465	16.875	15.534
	SLG DUTY:	14.492	4.	Z2= 19.6465	17.335	
208. VOLTS	LN/LN:	12.236		Z0= 18.1666		
	LN/LN/GND:	14.300 (14.875 GND RETURN KA)				
3C04.1	3P Duty:	28.829	5.	Z1= 4.1722	35.882	32.457
	SLG DUTY:	32.809	5.	Z2= 4.1722	41.779	
480. VOLTS	LN/LN:	24.967		Z0= 2.6600		
	LN/LN/GND:	30.714 (38.044 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
4B01.1	3P Duty:	30.509	5.	Z1= 9.0981	37.472	34.084
	SLG DUTY:	32.928	5.	Z2= 9.0981	40.663	
208. VOLTS	LN/LN:	26.421		Z0= 7.0933		
	LN/LN/GND:	31.748 (35.764 GND RETURN KA)				
4B02.1	3P Duty:	14.035	4.	Z1= 19.7767	17.006	15.558
	SLG DUTY:	14.536	4.	Z2= 19.7767	17.662	
208. VOLTS	LN/LN:	12.155		Z0= 17.7333		
	LN/LN/GND:	14.267 (15.074 GND RETURN KA)				
4B04.1	3P Duty:	14.021	4.	Z1= 19.7965	16.963	15.529
	SLG DUTY:	14.526	4.	Z2= 19.7965	17.631	
208. VOLTS	LN/LN:	12.143		Z0= 17.7333		
	LN/LN/GND:	14.250 (15.068 GND RETURN KA)				
4B05.1	3P Duty:	14.000	4.	Z1= 19.8269	16.898	15.485
	SLG DUTY:	14.511	4.	Z2= 19.8269	17.584	
208. VOLTS	LN/LN:	12.124		Z0= 17.7333		
	LN/LN/GND:	14.222 (15.060 GND RETURN KA)				
4C01.1	3P Duty:	41.151	5.	Z1= 6.7453	52.455	46.984
	SLG DUTY:	44.270	6.	Z2= 6.7453	56.794	
208. VOLTS	LN/LN:	35.638		Z0= 5.3200		
	LN/LN/GND:	42.719 (47.900 GND RETURN KA)				
4C01.2	3P Duty:	9.966	4.	Z1= 12.0687	12.137	11.080
	SLG DUTY:	10.376	4.	Z2= 12.0687	12.651	
480. VOLTS	LN/LN:	8.631		Z0= 10.6400		
	LN/LN/GND:	10.176 (10.820 GND RETURN KA)				
4C02.1	3P Duty:	40.983	5.	Z1= 6.7729	51.824	46.571
	SLG DUTY:	44.142	5.	Z2= 6.7729	56.296	
208. VOLTS	LN/LN:	35.492		Z0= 5.3200		
	LN/LN/GND:	42.499 (47.825 GND RETURN KA)				
4C02.2	3P Duty:	4.791	4.	Z1= 25.1033	5.765	5.290
	SLG DUTY:	4.886	4.	Z2= 25.1033	5.884	
480. VOLTS	LN/LN:	4.150		Z0= 23.6445		
	LN/LN/GND:	4.837 (4.985 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
4C03.1	3P Duty:	32.344	5.	Z1= 8.5818	39.627	36.083
	SLG DUTY:	34.330	5.	Z2= 8.5818	42.328	
208. VOLTS	LN/LN:	28.011		Z0= 7.0933		
	LN/LN/GND:	33.266 (36.575 GND RETURN KA)				
4C04.1	3P Duty:	14.436	4.	Z1= 19.2283	17.511	16.012
	SLG DUTY:	14.820	4.	Z2= 19.2283	18.022	
208. VOLTS	LN/LN:	12.502		Z0= 17.7333		
	LN/LN/GND:	14.606 (15.225 GND RETURN KA)				
5C01.1	3P Duty:	23.569	7.	Z1= 5.1033	31.421	27.645
	SLG DUTY:	25.824	7.	Z2= 5.1033	34.395	
480. VOLTS	LN/LN:	20.412		Z0= 3.7667		
	LN/LN/GND:	24.926 (28.555 GND RETURN KA)				
5C01.1.2	3P Duty:	23.439	6.	Z1= 5.1317	30.943	27.329
	SLG DUTY:	25.434	6.	Z2= 5.1317	32.955	
480. VOLTS	LN/LN:	20.299		Z0= 3.9277		
	LN/LN/GND:	24.947 (27.793 GND RETURN KA)				
5C01.2	3P Duty:	33.279	9.	Z1= 3.6143	46.936	40.423
	SLG DUTY:	37.950	9.	Z2= 3.6143	53.859	
480. VOLTS	LN/LN:	28.820		Z0= 2.2800		
	LN/LN/GND:	36.141 (44.145 GND RETURN KA)				
5C012.1	3P Duty:	33.032	8.	Z1= 3.6414	45.852	39.724
	SLG DUTY:	37.155	7.	Z2= 3.6414	50.321	
480. VOLTS	LN/LN:	28.606		Z0= 2.4330		
	LN/LN/GND:	36.252 (42.438 GND RETURN KA)				
G01	3P Duty:	4.004	20.	Z1= 30.0375	6.282	5.213
	SLG DUTY:	4.004	20.	Z2= 30.0375	6.282	
480. VOLTS	LN/LN:	3.468		Z0= 30.0375		
	LN/LN/GND:	4.004 (4.004 GND RETURN KA)				
G01.1	3P Duty:	3.963	18.	Z1= 30.3473	6.160	5.128
	SLG DUTY:	3.944	17.	Z2= 30.3473	6.088	
480. VOLTS	LN/LN:	3.432		Z0= 30.8089		
	LN/LN/GND:	3.966 (3.924 GND RETURN KA)				

U N B A L A N C E D F A U L T R E P O R T
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT DUTIES	KA (RMS)	X/R	EQUIVALENT (PU) FAULT IMPEDANCE	ASYM. KA AT 0.5 CYCLES * MAX. RMS	AVG. RMS *
G01.1.2	3P Duty:	3.661	11.	Z1= 32.8507	5.335	4.541
	SLG DUTY:	3.509	8.	Z2= 32.8507	4.889	
480. VOLTS	LN/LN:	3.171		Z0= 37.2067		
	LN/LN/GND:	3.668 (	3.366 GND RETURN KA)			
G01.2	3P Duty:	3.963	18.	Z1= 30.3473	6.160	5.128
	SLG DUTY:	3.944	17.	Z2= 30.3473	6.088	
480. VOLTS	LN/LN:	3.432		Z0= 30.8089		
	LN/LN/GND:	3.966 (	3.924 GND RETURN KA)			

F A U L T S T U D Y S U M M A R Y
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BUS RECORD NO NAME	VOLTAGE L-L	A V A I L A B L E 3 PHASE	X/R	F A U L T LINE/GRND	D U T I E S (KA) X/R
1A01A.1	480.	9.522	5.01	10.001	4.91
1A01A.1.1	480.	9.501	4.94	9.941	4.72
1A01A.1.2	480.	9.031	4.57	9.181	4.13
1A01A.1.3	480.	9.031	4.57	9.181	4.13
1A01A.1.4	480.	8.812	4.41	8.841	3.91
1A01A.1.4.1	480.	7.828	3.58	7.390	2.92
1A01A.1.4.2	480.	8.682	4.19	8.635	3.62
1A01A.2	208.	14.014	4.35	14.454	4.29
1A01A1.4.2	208.	7.536	4.00	8.617	3.98
1A01A1.4.3	208.	7.444	3.92	8.434	3.80
1A02.1	208.	20.088	4.74	21.052	4.73
1A03.1	208.	34.486	5.42	37.464	5.50
1A04.1	208.	23.261	4.65	24.588	4.66
1B01.1	208.	10.194	3.96	10.436	3.94
1B02.1	208.	10.210	3.92	10.459	3.91
1B03.1	208.	10.221	3.91	10.473	3.91
2A01.1	208.	28.757	5.36	30.737	5.33
2A02.1	208.	36.223	5.44	39.511	5.51
2A03.1	208.	28.618	5.03	30.662	5.09
2C01.1	208.	5.772	3.41	5.830	3.40
2C02.1	208.	14.108	4.12	14.461	4.13
2C03.1	480.	9.621	4.50	10.011	4.56
2C03.2	208.	14.164	4.09	14.526	4.11
2C04.1	208.	29.504	4.69	31.163	4.84
3B01.1	480.	16.576	5.48	18.167	5.54
3B02.1	480.	26.280	6.14	30.548	6.48
3B03.1	208.	38.268	5.47	42.001	5.60
3B04.1	208.	30.600	4.69	32.998	4.77
3C01.1	208.	14.001	4.14	14.345	4.14
3C02.1	208.	22.446	4.49	23.370	4.55
3C03.1	208.	14.128	4.07	14.492	4.09
3C04.1	480.	28.829	4.86	32.809	5.38
4B01.1	208.	30.509	4.59	32.928	4.70
4B02.1	208.	14.035	4.33	14.536	4.38
4B04.1	208.	14.021	4.30	14.526	4.36
4B05.1	208.	14.000	4.26	14.511	4.33
4C01.1	208.	41.151	5.40	44.270	5.56
4C01.2	480.	9.966	4.42	10.376	4.45
4C02.1	208.	40.983	5.21	44.142	5.41
4C02.2	480.	4.791	4.20	4.886	4.21
4C03.1	208.	32.344	4.54	34.330	4.67
4C04.1	208.	14.436	4.35	14.820	4.40
5C01.1	480.	23.569	6.65	25.824	6.62
5C01.1.2	480.	23.439	6.34	25.434	5.82

F A U L T S T U D Y S U M M A R Y
(FOR APPLICATION OF LOW VOLTAGE BREAKERS)
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

BUS RECORD NO	NAME	VOLTAGE L-L	A V A I L A B L E 3 PHASE	X/R	F A U L T LINE/GRND	D U T I E S (KA) X/R
5C01.2		480.	33.279	8.92	37.950	9.25
5C012.1		480.	33.032	8.17	37.155	7.19
G01		480.	4.004	20.00	4.004	20.00
G01.1		480.	3.963	18.17	3.944	17.04
G01.1.2		480.	3.661	10.88	3.509	8.33
G01.2		480.	3.963	18.17	3.944	17.04

50 FAULTED BUSES, 134 BRANCHES, 2 CONTRIBUTIONS
UNBALANCED FAULTS REQUESTED

*** SHORT CIRCUIT STUDY COMPLETE ***

THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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0.000           E/Z:      6.303 KA AT  -82.07 DEG ( 376.64 MVA)  X/R:     7.18
                SYM*1.6:   10.085 KA       MOMENTARY BASED ON X/R:    8.535 KA
                SYM*2.7:   17.018 KA           CREST BASED ON X/R:   14.669 KA
                VOLTAGE:  34500.   EQUIV. IMPEDANCE=  0.4359 + J  3.1300  OHMS
                CONTRIBUTIONS:  NMPC              6.303 KA      ANG:   -82.07

0.01            E/Z:      6.299 KA AT  -82.00 DEG ( 376.39 MVA)  X/R:     7.11
                SYM*1.6:   10.078 KA       MOMENTARY BASED ON X/R:    8.513 KA
                SYM*2.7:   17.007 KA           CREST BASED ON X/R:   14.635 KA
                VOLTAGE:  34500.   EQUIV. IMPEDANCE=  0.4402 + J  3.1315  OHMS
                T1              0.1               0.000 KA      ANG:   -37.65
                XLN-0001        0.000             6.299 KA      ANG:   -82.00

0.02            E/Z:      6.299 KA AT  -82.00 DEG ( 376.39 MVA)  X/R:     7.11
                SYM*1.6:   10.078 KA       MOMENTARY BASED ON X/R:    8.513 KA
                SYM*2.7:   17.007 KA           CREST BASED ON X/R:   14.635 KA
                VOLTAGE:  34500.   EQUIV. IMPEDANCE=  0.4402 + J  3.1315  OHMS
                T2              0.2               0.000 KA      ANG:   -98.36
                XLN-0003        0.000             6.299 KA      ANG:   -82.00

0.03            E/Z:      6.299 KA AT  -82.00 DEG ( 376.39 MVA)  X/R:     7.11
                SYM*1.6:   10.078 KA       MOMENTARY BASED ON X/R:    8.513 KA
                SYM*2.7:   17.007 KA           CREST BASED ON X/R:   14.635 KA
                VOLTAGE:  34500.   EQUIV. IMPEDANCE=  0.4402 + J  3.1315  OHMS
                T3              0.3               0.000 KA      ANG:    61.97
                XLN-0004        0.000             6.299 KA      ANG:   -82.00

0.1             E/Z:      2.506 KA AT  -85.55 DEG (  57.30 MVA)  X/R:    12.85
                SYM*1.6:    4.010 KA       MOMENTARY BASED ON X/R:    3.740 KA
                SYM*2.7:    6.767 KA           CREST BASED ON X/R:    6.320 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.2360 + J  3.0315  OHMS
                CBL-001         0.1.1             0.000 KA      ANG:  -221.61
                T1              0.01              2.506 KA      ANG:    94.45

0.1.1           E/Z:      2.505 KA AT  -85.53 DEG (  57.28 MVA)  X/R:    12.78
                SYM*1.6:    4.009 KA       MOMENTARY BASED ON X/R:    3.736 KA
                SYM*2.7:    6.765 KA           CREST BASED ON X/R:    6.314 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.2373 + J  3.0326  OHMS
                CBL-001         0.1               2.505 KA      ANG:   -85.53
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THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

0.1.2	E/Z:	2.415 KA AT -83.44 DEG (55.21 MVA)		X/R:	8.70
	SYM*1.6:	3.864 KA	MOMENTARY BASED ON X/R:		3.391 KA
	SYM*2.7:	6.520 KA	CREST BASED ON X/R:		5.795 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.3604 + J 3.1352 OHMS			
	CBL-002	0.1.1	2.415 KA	ANG:	96.56
0.2	E/Z:	2.506 KA AT -85.55 DEG (57.30 MVA)		X/R:	12.85
	SYM*1.6:	4.010 KA	MOMENTARY BASED ON X/R:		3.740 KA
	SYM*2.7:	6.767 KA	CREST BASED ON X/R:		6.320 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.2360 + J 3.0315 OHMS			
	CBL-079	0.2.1	0.000 KA	ANG:	-98.74
	T2	0.02	2.506 KA	ANG:	94.45
0.2.1	E/Z:	2.505 KA AT -85.53 DEG (57.28 MVA)		X/R:	12.78
	SYM*1.6:	4.009 KA	MOMENTARY BASED ON X/R:		3.736 KA
	SYM*2.7:	6.765 KA	CREST BASED ON X/R:		6.314 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.2373 + J 3.0326 OHMS			
	CBL-079	0.2	2.505 KA	ANG:	-85.53
0.2.2	E/Z:	2.415 KA AT -83.44 DEG (55.21 MVA)		X/R:	8.70
	SYM*1.6:	3.864 KA	MOMENTARY BASED ON X/R:		3.391 KA
	SYM*2.7:	6.520 KA	CREST BASED ON X/R:		5.795 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.3604 + J 3.1352 OHMS			
	CBL-080	0.2.1	2.415 KA	ANG:	96.56
0.3	E/Z:	3.472 KA AT -85.26 DEG (79.38 MVA)		X/R:	12.06
	SYM*1.6:	5.555 KA	MOMENTARY BASED ON X/R:		5.135 KA
	SYM*2.7:	9.374 KA	CREST BASED ON X/R:		8.694 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.1814 + J 2.1876 OHMS			
	CBL-082	0.3.1	0.000 KA	ANG:	84.67
	T3	0.03	3.472 KA	ANG:	-265.26
0.3.1	E/Z:	3.469 KA AT -85.22 DEG (79.32 MVA)		X/R:	11.96
	SYM*1.6:	5.551 KA	MOMENTARY BASED ON X/R:		5.126 KA
	SYM*2.7:	9.368 KA	CREST BASED ON X/R:		8.679 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.1831 + J 2.1889 OHMS			
	CBL-082	0.3	3.469 KA	ANG:	-85.22
0.3.2	E/Z:	3.300 KA AT -82.45 DEG (75.45 MVA)		X/R:	7.54
	SYM*1.6:	5.280 KA	MOMENTARY BASED ON X/R:		4.513 KA
	SYM*2.7:	8.910 KA	CREST BASED ON X/R:		7.745 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.3034 + J 2.2893 OHMS			

THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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CONTRIBUTIONS TO 0.3.2 (CONTINUED)

	CBL-083	0.3.1	3.300 KA	ANG:	-262.45
0A	E/Z:	2.415 KA AT -83.44 DEG (55.21 MVA)		X/R:	8.70
	SYM*1.6:	3.864 KA	MOMENTARY BASED ON X/R:		3.390 KA
	SYM*2.7:	6.520 KA	CREST BASED ON X/R:		5.795 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.3604 + J 3.1353 OHMS			
	CBL-081	0.2.2	2.415 KA	ANG:	96.56
0B	E/Z:	2.415 KA AT -83.44 DEG (55.21 MVA)		X/R:	8.70
	SYM*1.6:	3.864 KA	MOMENTARY BASED ON X/R:		3.390 KA
	SYM*2.7:	6.520 KA	CREST BASED ON X/R:		5.795 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.3604 + J 3.1353 OHMS			
	CBL-003	0.1.2	2.415 KA	ANG:	96.56
0C	E/Z:	3.300 KA AT -82.45 DEG (75.45 MVA)		X/R:	7.54
	SYM*1.6:	5.280 KA	MOMENTARY BASED ON X/R:		4.512 KA
	SYM*2.7:	8.910 KA	CREST BASED ON X/R:		7.745 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.3034 + J 2.2893 OHMS			
	CBL-084	0.3.2	3.300 KA	ANG:	-82.45
1A.01	E/Z:	2.411 KA AT -83.29 DEG (55.13 MVA)		X/R:	8.50
	SYM*1.6:	3.858 KA	MOMENTARY BASED ON X/R:		3.371 KA
	SYM*2.7:	6.511 KA	CREST BASED ON X/R:		5.766 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.3694 + J 3.1388 OHMS			
	CBL-029	1A.02	0.000 KA	ANG:	-27.58
	CBL-026	0A	2.411 KA	ANG:	-83.29
1A.01A	E/Z:	2.406 KA AT -83.07 DEG (55.02 MVA)		X/R:	8.23
	SYM*1.6:	3.850 KA	MOMENTARY BASED ON X/R:		3.345 KA
	SYM*2.7:	6.497 KA	CREST BASED ON X/R:		5.726 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.3822 + J 3.1439 OHMS			
	CBL-031	1A.01A.2	0.000 KA	ANG:	-38.07
	CBL-075	1A.01	2.406 KA	ANG:	-83.07

THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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1A.01A.1        E/Z:      2.406 KA AT  -83.07 DEG (  55.02 MVA)  X/R:     8.23
                SYM*1.6:    3.850 KA       MOMENTARY BASED ON X/R:    3.344 KA
                SYM*2.7:    6.497 KA           CREST BASED ON X/R:    5.726 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.3822 + J  3.1439  OHMS
                LEE 480         1A01A.1            0.000 KA      ANG:    52.25
                CBL-030         1A.01A             2.406 KA      ANG:    96.93

1A.01A.2        E/Z:      2.406 KA AT  -83.07 DEG (  55.02 MVA)  X/R:     8.23
                SYM*1.6:    3.850 KA       MOMENTARY BASED ON X/R:    3.344 KA
                SYM*2.7:    6.497 KA           CREST BASED ON X/R:    5.726 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.3822 + J  3.1439  OHMS
                LEE 208         1A01A.2            0.000 KA      ANG:   -38.07
                CBL-031         1A.01A             2.406 KA      ANG:  -263.07

1A.02           E/Z:      2.304 KA AT  -78.87 DEG (  52.68 MVA)  X/R:     5.09
                SYM*1.6:    3.687 KA       MOMENTARY BASED ON X/R:    2.898 KA
                SYM*2.7:    6.221 KA           CREST BASED ON X/R:    5.015 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.6382 + J  3.2453  OHMS
                CBL-033         1A.02.1            0.000 KA      ANG:   -33.87
                CBL-029         1A.01              2.304 KA      ANG:   -78.87

1A.02.1         E/Z:      2.304 KA AT  -78.87 DEG (  52.68 MVA)  X/R:     5.09
                SYM*1.6:    3.687 KA       MOMENTARY BASED ON X/R:    2.898 KA
                SYM*2.7:    6.221 KA           CREST BASED ON X/R:    5.015 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.6382 + J  3.2453  OHMS
                RIGGS XFMR      1A02.1             0.000 KA      ANG:  -156.85
                CBL-033         1A.02              2.304 KA      ANG:   -78.87

1A.03           E/Z:      2.278 KA AT  -77.88 DEG (  52.09 MVA)  X/R:     4.66
                SYM*1.6:    3.645 KA       MOMENTARY BASED ON X/R:    2.808 KA
                SYM*2.7:    6.151 KA           CREST BASED ON X/R:    4.863 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.7022 + J  3.2706  OHMS
                CBL-034         1A.04              0.000 KA      ANG:  -226.36
                CBL-032         1A.02              2.278 KA      ANG:   -77.88

1A.03.1         E/Z:      2.278 KA AT  -77.88 DEG (  52.09 MVA)  X/R:     4.66
                SYM*1.6:    3.645 KA       MOMENTARY BASED ON X/R:    2.808 KA
                SYM*2.7:    6.151 KA           CREST BASED ON X/R:    4.863 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.7022 + J  3.2707  OHMS
                JOHNS XFMR      1A03.1             0.000 KA      ANG:   -94.52
                CBL-035         1A.03              2.278 KA      ANG:   -77.88
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THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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1A.04          E/Z:      2.263 KA AT  -77.30 DEG (  51.73 MVA)  X/R:     4.44
               SYM*1.6:    3.620 KA       MOMENTARY BASED ON X/R:    2.757 KA
               SYM*2.7:    6.109 KA           CREST BASED ON X/R:    4.776 KA
               VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.7406 + J  3.2858  OHMS
               CBL-036         1A.04.1            0.000 KA      ANG:   -32.30
               CBL-034         1A.03              2.263 KA      ANG:   -77.30

1A.04.1        E/Z:      2.263 KA AT  -77.30 DEG (  51.73 MVA)  X/R:     4.44
               SYM*1.6:    3.620 KA       MOMENTARY BASED ON X/R:    2.757 KA
               SYM*2.7:    6.109 KA           CREST BASED ON X/R:    4.776 KA
               VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.7406 + J  3.2859  OHMS
               LAKE XFMR       1A04.1             0.000 KA      ANG:    24.73
               CBL-036         1A.04              2.263 KA      ANG:   -77.30

1A01A.1        VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

1A01A.1.1      VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

1A01A.1.2      VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

1A01A.1.3      VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

1A01A.1.4      VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

1A01A.1.4.1    VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

1A01A.1.4.2    VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

1A01A.2        VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

1A01A1.4.2     VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

1A01A1.4.3     VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

1A02.1         VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

1A03.1         VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

1A04.1         VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

1B.01          E/Z:      2.303 KA AT  -78.81 DEG (  52.65 MVA)  X/R:     5.06
               SYM*1.6:    3.684 KA       MOMENTARY BASED ON X/R:    2.892 KA
               SYM*2.7:    6.217 KA           CREST BASED ON X/R:    5.006 KA
               VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.6420 + J  3.2468  OHMS
               CBL-027         1B.01.1            0.000 KA      ANG:   -33.81
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T H R E E P H A S E M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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CONTRIBUTIONS TO 1B.01 (CONTINUED)
CBL-025 0B 2.303 KA ANG: -78.81

1B.01.1 E/Z: 2.303 KA AT -78.81 DEG (52.64 MVA) X/R: 5.06
SYM*1.6: 3.684 KA MOMENTARY BASED ON X/R: 2.892 KA
SYM*2.7: 6.217 KA CREST BASED ON X/R: 5.006 KA
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6420 + J 3.2469 OHMS
WATER XFMR 1B01.1 0.000 KA ANG: -33.81
CBL-027 1B.01 2.303 KA ANG: -78.81

1B.02 E/Z: 2.253 KA AT -76.95 DEG (51.52 MVA) X/R: 4.31
SYM*1.6: 3.605 KA MOMENTARY BASED ON X/R: 2.728 KA
SYM*2.7: 6.084 KA CREST BASED ON X/R: 4.725 KA
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7636 + J 3.2950 OHMS
CBL-085 1B.03 0.000 KA ANG: -31.95
CBL-028 1B.01 2.253 KA ANG: -76.95

1B.02.1 E/Z: 2.253 KA AT -76.95 DEG (51.51 MVA) X/R: 4.31
SYM*1.6: 3.605 KA MOMENTARY BASED ON X/R: 2.728 KA
SYM*2.7: 6.084 KA CREST BASED ON X/R: 4.725 KA
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7636 + J 3.2950 OHMS
SCALES XFMR 1B02.1 0.000 KA ANG: -31.95
CBL-0237 1B.02 2.253 KA ANG: -76.95

1B.03 E/Z: 2.235 KA AT -76.29 DEG (51.10 MVA) X/R: 4.10
SYM*1.6: 3.576 KA MOMENTARY BASED ON X/R: 2.674 KA
SYM*2.7: 6.034 KA CREST BASED ON X/R: 4.629 KA
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.8084 + J 3.3127 OHMS
CBL-0238 1B.03.1 0.000 KA ANG: -31.29
CBL-085 1B.02 2.235 KA ANG: -76.29

1B.03.1 E/Z: 2.235 KA AT -76.29 DEG (51.10 MVA) X/R: 4.10
SYM*1.6: 3.576 KA MOMENTARY BASED ON X/R: 2.674 KA
SYM*2.7: 6.034 KA CREST BASED ON X/R: 4.629 KA
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.8084 + J 3.3128 OHMS
WALKER XFMR 1B03.1 0.000 KA ANG: -31.29
CBL-0238 1B.03 2.235 KA ANG: -76.29

1B01.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

1B02.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

1B03.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

2A.01	E/Z:	2.344 KA AT -80.45 DEG (53.59 MVA)		X/R:	5.94
	SYM*1.6:	3.750 KA	MOMENTARY BASED ON X/R:		3.051 KA
	SYM*2.7:	6.329 KA	CREST BASED ON X/R:		5.268 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.5396 + J 3.2062 OHMS			
	CBL-039	2A.01.1	0.000 KA	ANG:	-35.45
	CBL-037	0A	2.344 KA	ANG:	-80.45
2A.01.1	E/Z:	2.344 KA AT -80.45 DEG (53.59 MVA)		X/R:	5.94
	SYM*1.6:	3.750 KA	MOMENTARY BASED ON X/R:		3.051 KA
	SYM*2.7:	6.329 KA	CREST BASED ON X/R:		5.268 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.5396 + J 3.2063 OHMS			
	CAMP CENT XFMR	2A01.1	0.000 KA	ANG:	-35.45
	CBL-039	2A.01	2.344 KA	ANG:	-80.45
2A.02	E/Z:	2.286 KA AT -78.16 DEG (52.25 MVA)		X/R:	4.77
	SYM*1.6:	3.657 KA	MOMENTARY BASED ON X/R:		2.832 KA
	SYM*2.7:	6.171 KA	CREST BASED ON X/R:		4.905 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.6843 + J 3.2635 OHMS			
	CBL-040	2A.03	0.000 KA	ANG:	-226.64
	CBL-038	2A.01	2.286 KA	ANG:	-78.16
2A.02.1	E/Z:	2.285 KA AT -78.16 DEG (52.25 MVA)		X/R:	4.77
	SYM*1.6:	3.657 KA	MOMENTARY BASED ON X/R:		2.832 KA
	SYM*2.7:	6.171 KA	CREST BASED ON X/R:		4.905 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.6843 + J 3.2636 OHMS			
	SNYGG XFMR	2A02.1	0.000 KA	ANG:	97.74
	CBL-041	2A.02	2.285 KA	ANG:	-78.16
2A.03	E/Z:	2.254 KA AT -76.99 DEG (51.54 MVA)		X/R:	4.33
	SYM*1.6:	3.607 KA	MOMENTARY BASED ON X/R:		2.732 KA
	SYM*2.7:	6.086 KA	CREST BASED ON X/R:		4.731 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7611 + J 3.2940 OHMS			
	CBL-043	2A.03.1	0.000 KA	ANG:	-31.99
	CBL-040	2A.02	2.254 KA	ANG:	-76.99
2A.03.1	E/Z:	2.254 KA AT -76.99 DEG (51.54 MVA)		X/R:	4.33
	SYM*1.6:	3.607 KA	MOMENTARY BASED ON X/R:		2.732 KA
	SYM*2.7:	6.086 KA	CREST BASED ON X/R:		4.731 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7611 + J 3.2940 OHMS			
	WILBER XFMR	2A03.1	0.000 KA	ANG:	-31.99
	CBL-043	2A.03	2.254 KA	ANG:	-76.99

THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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2A01.1          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

2A02.1          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

2A03.1          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

2C.01           E/Z:      3.074 KA AT  -76.05 DEG (  70.28 MVA)  X/R:     4.02
                SYM*1.6:    4.919 KA       MOMENTARY BASED ON X/R:    3.663 KA
                SYM*2.7:    8.300 KA           CREST BASED ON X/R:    6.339 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.5978 + J  2.4059  OHMS
                CBL-051         2C.01.1            0.000 KA      ANG:   -31.05
                CBL-050         0C                 3.074 KA      ANG:  -256.05

2C.01.1         E/Z:      3.074 KA AT  -76.05 DEG (  70.28 MVA)  X/R:     4.02
                SYM*1.6:    4.918 KA       MOMENTARY BASED ON X/R:    3.663 KA
                SYM*2.7:    8.300 KA           CREST BASED ON X/R:    6.339 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.5979 + J  2.4060  OHMS
                SERV XFMR       2C01.1             0.000 KA      ANG:   -31.05
                CBL-051         2C.01              3.074 KA      ANG:   -76.05

2C.02           E/Z:      3.034 KA AT  -75.02 DEG (  69.38 MVA)  X/R:     3.74
                SYM*1.6:    4.855 KA       MOMENTARY BASED ON X/R:    3.555 KA
                SYM*2.7:    8.193 KA           CREST BASED ON X/R:    6.143 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.6490 + J  2.4262  OHMS
                CBL-053         2C.02.1            0.000 KA      ANG:   -30.02
                CBL-052         2C.01              3.034 KA      ANG:   -75.02

2C.02.1         E/Z:      3.034 KA AT  -75.02 DEG (  69.37 MVA)  X/R:     3.74
                SYM*1.6:    4.855 KA       MOMENTARY BASED ON X/R:    3.555 KA
                SYM*2.7:    8.193 KA           CREST BASED ON X/R:    6.143 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.6491 + J  2.4263  OHMS
                MACKIN XFMR     2C02.1             0.000 KA      ANG:   -30.02
                CBL-053         2C.02              3.034 KA      ANG:   -75.02

2C.03           E/Z:      2.985 KA AT  -73.78 DEG (  68.24 MVA)  X/R:     3.44
                SYM*1.6:    4.776 KA       MOMENTARY BASED ON X/R:    3.432 KA
                SYM*2.7:    8.059 KA           CREST BASED ON X/R:    5.914 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.7130 + J  2.4516  OHMS
                CBL-055         2C.03.1            0.000 KA      ANG:   -28.78
                CBL-054         2C.02              2.985 KA      ANG:   -73.78
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THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

2C.03.1	E/Z:	2.985 KA AT -73.78 DEG (68.24 MVA)	X/R:	3.44	
	SYM*1.6:	4.776 KA	MOMENTARY BASED ON X/R:	3.431 KA	
	SYM*2.7:	8.059 KA	CREST BASED ON X/R:	5.914 KA	
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7131 + J 2.4516 OHMS			
	RICH 2 XFMR	2C03.1	0.000 KA	ANG:	28.24
	CBL-055	2C.03	2.985 KA	ANG:	-73.78
2C.03.2	E/Z:	2.985 KA AT -73.78 DEG (68.24 MVA)	X/R:	3.44	
	SYM*1.6:	4.776 KA	MOMENTARY BASED ON X/R:	3.431 KA	
	SYM*2.7:	8.059 KA	CREST BASED ON X/R:	5.914 KA	
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7131 + J 2.4516 OHMS			
	RICH 1 XFMR	2C03.2	0.000 KA	ANG:	-150.23
	CBL-056	2C.03	2.985 KA	ANG:	-73.78
2C.04	E/Z:	2.892 KA AT -71.54 DEG (66.12 MVA)	X/R:	2.99	
	SYM*1.6:	4.627 KA	MOMENTARY BASED ON X/R:	3.227 KA	
	SYM*2.7:	7.808 KA	CREST BASED ON X/R:	5.522 KA	
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.8346 + J 2.4997 OHMS			
	CBL-058	2C.04.1	0.000 KA	ANG:	-26.54
	CBL-057	2C.03	2.892 KA	ANG:	-71.54
2C.04.1	E/Z:	2.892 KA AT -71.54 DEG (66.11 MVA)	X/R:	2.99	
	SYM*1.6:	4.627 KA	MOMENTARY BASED ON X/R:	3.227 KA	
	SYM*2.7:	7.808 KA	CREST BASED ON X/R:	5.522 KA	
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.8347 + J 2.4998 OHMS			
	PARK XFMR	2C04.1	0.000 KA	ANG:	-74.77
	CBL-058	2C.04	2.892 KA	ANG:	-71.54
2C01.1	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
2C02.1	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
2C03.1	VOLTAGE:	480. (SEE LOW VOLTAGE REPORT)			
2C03.2	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
2C04.1	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
3B.01	E/Z:	2.294 KA AT -78.48 DEG (52.44 MVA)	X/R:	4.90	
	SYM*1.6:	3.670 KA	MOMENTARY BASED ON X/R:	2.861 KA	
	SYM*2.7:	6.193 KA	CREST BASED ON X/R:	4.953 KA	
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.6638 + J 3.2554 OHMS			
	CBL-011	3B.01.1	0.000 KA	ANG:	-33.48
	CBL-007	0B	2.294 KA	ANG:	-78.48

THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

3B.01.1	E/Z:	2.294 KA AT -78.48 DEG (52.44 MVA)		X/R:	4.90
	SYM*1.6:	3.670 KA	MOMENTARY BASED ON X/R:		2.861 KA
	SYM*2.7:	6.193 KA	CREST BASED ON X/R:		4.953 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.6638 + J 3.2555 OHMS			
	CONVOCATION	3B01.1	0.000 KA	ANG:	-33.48
	CBL-011	3B.01	2.294 KA	ANG:	-78.48
3B.02	E/Z:	2.277 KA AT -77.82 DEG (52.05 MVA)		X/R:	4.63
	SYM*1.6:	3.643 KA	MOMENTARY BASED ON X/R:		2.803 KA
	SYM*2.7:	6.147 KA	CREST BASED ON X/R:		4.854 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7060 + J 3.2721 OHMS			
	CBL-015	3B.02.1	0.000 KA	ANG:	-32.82
	CBL-087	3B.01	2.277 KA	ANG:	102.18
3B.02.1	E/Z:	2.277 KA AT -77.82 DEG (52.05 MVA)		X/R:	4.63
	SYM*1.6:	3.643 KA	MOMENTARY BASED ON X/R:		2.803 KA
	SYM*2.7:	6.147 KA	CREST BASED ON X/R:		4.854 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7060 + J 3.2722 OHMS			
	PEN XFMR	3B02.1	0.000 KA	ANG:	-32.82
	CBL-015	3B.02	2.277 KA	ANG:	-77.82
3B.03	E/Z:	2.259 KA AT -77.18 DEG (51.66 MVA)		X/R:	4.40
	SYM*1.6:	3.615 KA	MOMENTARY BASED ON X/R:		2.748 KA
	SYM*2.7:	6.101 KA	CREST BASED ON X/R:		4.759 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7483 + J 3.2889 OHMS			
	CBL-017	3B.04	0.000 KA	ANG:	-215.36
	CBL-014	3B.02	2.259 KA	ANG:	-77.18
3B.03.1	E/Z:	2.259 KA AT -77.18 DEG (51.66 MVA)		X/R:	4.40
	SYM*1.6:	3.615 KA	MOMENTARY BASED ON X/R:		2.748 KA
	SYM*2.7:	6.100 KA	CREST BASED ON X/R:		4.759 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7483 + J 3.2889 OHMS			
	LAN XFMR	3B03.1	0.000 KA	ANG:	-67.72
	CBL-018	3B.03	2.259 KA	ANG:	-77.18
3B.04	E/Z:	2.209 KA AT -75.34 DEG (50.50 MVA)		X/R:	3.82
	SYM*1.6:	3.534 KA	MOMENTARY BASED ON X/R:		2.601 KA
	SYM*2.7:	5.963 KA	CREST BASED ON X/R:		4.497 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.8731 + J 3.3383 OHMS			
	CBL-022	3B.04.1	0.000 KA	ANG:	-30.34
	CBL-017	3B.03	2.209 KA	ANG:	-75.34

THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

3B.04.1	E/Z:	2.209 KA AT -75.34 DEG (50.49 MVA)		X/R:	3.82
	SYM*1.6:	3.534 KA	MOMENTARY BASED ON X/R:		2.601 KA
	SYM*2.7:	5.963 KA	CREST BASED ON X/R:		4.497 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.8731 + J 3.3384 OHMS			
	MAHAR XFMR	3B04.1	0.000 KA	ANG:	-30.34
	CBL-022	3B.04	2.209 KA	ANG:	-75.34
3B01.1	VOLTAGE:	480. (SEE LOW VOLTAGE REPORT)			
3B02.1	VOLTAGE:	480. (SEE LOW VOLTAGE REPORT)			
3B03.1	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
3B04.1	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
3C.01	E/Z:	3.069 KA AT -75.92 DEG (70.17 MVA)		X/R:	3.99
	SYM*1.6:	4.911 KA	MOMENTARY BASED ON X/R:		3.649 KA
	SYM*2.7:	8.287 KA	CREST BASED ON X/R:		6.314 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.6042 + J 2.4085 OHMS			
	CBL-060	3C.01.1	0.000 KA	ANG:	-30.92
	CBL-059	0C	3.069 KA	ANG:	-255.92
3C.01.1	E/Z:	3.069 KA AT -75.92 DEG (70.17 MVA)		X/R:	3.99
	SYM*1.6:	4.911 KA	MOMENTARY BASED ON X/R:		3.649 KA
	SYM*2.7:	8.286 KA	CREST BASED ON X/R:		6.314 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.6043 + J 2.4085 OHMS			
	FUNNELL XFMR	3C01.1	0.000 KA	ANG:	-88.93
	CBL-060	3C.01	3.069 KA	ANG:	-75.92
3C.02	E/Z:	2.975 KA AT -73.54 DEG (68.02 MVA)		X/R:	3.38
	SYM*1.6:	4.760 KA	MOMENTARY BASED ON X/R:		3.408 KA
	SYM*2.7:	8.033 KA	CREST BASED ON X/R:		5.870 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7258 + J 2.4566 OHMS			
	CBL-062	3C.02.1	0.000 KA	ANG:	-28.54
	CBL-061	3C.01	2.975 KA	ANG:	-73.54
3C.02.1	E/Z:	2.975 KA AT -73.54 DEG (68.02 MVA)		X/R:	3.38
	SYM*1.6:	4.760 KA	MOMENTARY BASED ON X/R:		3.408 KA
	SYM*2.7:	8.033 KA	CREST BASED ON X/R:		5.870 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7259 + J 2.4567 OHMS			
	COOPER XFMR	3C02.1	0.000 KA	ANG:	28.49
	CBL-062	3C.02	2.975 KA	ANG:	-73.54

THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

3C.03	E/Z:	2.950 KA AT -72.94 DEG (67.46 MVA)		X/R:	3.26
	SYM*1.6:	4.721 KA	MOMENTARY BASED ON X/R:		3.352 KA
	SYM*2.7:	7.966 KA	CREST BASED ON X/R:		5.764 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7578 + J 2.4693 OHMS			
	CBL-064	3C.03.1	0.000 KA	ANG:	-27.94
	CBL-063	3C.02	2.950 KA	ANG:	-72.94
3C.03.1	E/Z:	2.950 KA AT -72.94 DEG (67.46 MVA)		X/R:	3.26
	SYM*1.6:	4.721 KA	MOMENTARY BASED ON X/R:		3.352 KA
	SYM*2.7:	7.966 KA	CREST BASED ON X/R:		5.763 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7579 + J 2.4694 OHMS			
	HART XFMR	3C03.1	0.000 KA	ANG:	-27.94
	CBL-064	3C.03	2.950 KA	ANG:	-72.94
3C.04	E/Z:	2.850 KA AT -70.56 DEG (65.16 MVA)		X/R:	2.83
	SYM*1.6:	4.560 KA	MOMENTARY BASED ON X/R:		3.145 KA
	SYM*2.7:	7.695 KA	CREST BASED ON X/R:		5.361 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.8898 + J 2.5216 OHMS			
	CBL-066	3C.04.1	0.000 KA	ANG:	-25.56
	CBL-065	3C.03	2.850 KA	ANG:	-70.56
3C.04.1	E/Z:	2.850 KA AT -70.56 DEG (65.16 MVA)		X/R:	2.83
	SYM*1.6:	4.560 KA	MOMENTARY BASED ON X/R:		3.145 KA
	SYM*2.7:	7.695 KA	CREST BASED ON X/R:		5.361 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.8898 + J 2.5216 OHMS			
	CULK XFMR	3C04.1	0.000 KA	ANG:	-25.56
	CBL-066	3C.04	2.850 KA	ANG:	-70.56
3C01.1	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
3C02.1	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
3C03.1	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			
3C04.1	VOLTAGE:	480. (SEE LOW VOLTAGE REPORT)			
4B.01	E/Z:	2.177 KA AT -74.23 DEG (49.76 MVA)		X/R:	3.54
	SYM*1.6:	3.483 KA	MOMENTARY BASED ON X/R:		2.519 KA
	SYM*2.7:	5.877 KA	CREST BASED ON X/R:		4.346 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.9518 + J 3.3695 OHMS			
	CBL-010	4B.01.1	0.000 KA	ANG:	-29.23
	CBL-006	0B	2.177 KA	ANG:	-74.23

THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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4B.01.1         E/Z:      2.177 KA AT  -74.23 DEG (  49.76 MVA)  X/R:     3.54
                SYM*1.6:    3.483 KA       MOMENTARY BASED ON X/R:    2.519 KA
                SYM*2.7:    5.877 KA           CREST BASED ON X/R:    4.345 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.9518 + J  3.3696  OHMS
                ONON XFMR       4B01.1             0.000 KA      ANG:   -29.23
                CBL-010         4B.01              2.177 KA      ANG:   -74.23

4B.02           E/Z:      2.134 KA AT  -72.79 DEG (  48.79 MVA)  X/R:     3.23
                SYM*1.6:    3.415 KA       MOMENTARY BASED ON X/R:    2.420 KA
                SYM*2.7:    5.762 KA           CREST BASED ON X/R:    4.159 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  1.0567 + J  3.4111  OHMS
                CBL-013         4B.02.1            0.000 KA      ANG:   -27.79
                CBL-008         4B.01              2.134 KA      ANG:   -72.79

4B.02.1         E/Z:      2.134 KA AT  -72.79 DEG (  48.79 MVA)  X/R:     3.23
                SYM*1.6:    3.415 KA       MOMENTARY BASED ON X/R:    2.420 KA
                SYM*2.7:    5.762 KA           CREST BASED ON X/R:    4.158 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  1.0568 + J  3.4111  OHMS
                ONEIDA XFMR     4B02.1             0.000 KA      ANG:   -27.79
                CBL-013         4B.02              2.134 KA      ANG:   -72.79

4B.04           E/Z:      2.112 KA AT  -72.04 DEG (  48.28 MVA)  X/R:     3.08
                SYM*1.6:    3.378 KA       MOMENTARY BASED ON X/R:    2.371 KA
                SYM*2.7:    5.701 KA           CREST BASED ON X/R:    4.065 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  1.1131 + J  3.4334  OHMS
                CBL-019         4B.05              0.000 KA      ANG:   -17.68
                CBL-012         4B.02              2.112 KA      ANG:   -72.04

4B.04.1         E/Z:      2.111 KA AT  -72.04 DEG (  48.27 MVA)  X/R:     3.08
                SYM*1.6:    3.378 KA       MOMENTARY BASED ON X/R:    2.371 KA
                SYM*2.7:    5.701 KA           CREST BASED ON X/R:    4.064 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  1.1131 + J  3.4334  OHMS
                LP XFMR         4B04.1             0.000 KA      ANG:   -27.04
                CBL-020         4B.04              2.111 KA      ANG:   -72.04

4B.05           E/Z:      2.077 KA AT  -70.92 DEG (  47.49 MVA)  X/R:     2.89
                SYM*1.6:    3.323 KA       MOMENTARY BASED ON X/R:    2.301 KA
                SYM*2.7:    5.608 KA           CREST BASED ON X/R:    3.928 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  1.1995 + J  3.4676  OHMS
                CBL-024         4B.05.1            0.000 KA      ANG:   -25.92
                CBL-019         4B.04              2.077 KA      ANG:   -70.92
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THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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4B.05.1         E/Z:      2.077 KA AT  -70.92 DEG (  47.49 MVA)  X/R:     2.89
                SYM*1.6:    3.323 KA       MOMENTARY BASED ON X/R:    2.301 KA
                SYM*2.7:    5.608 KA           CREST BASED ON X/R:    3.928 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  1.1995 + J  3.4677  OHMS
                CAYUGA XFMR     4B05.1             0.000 KA      ANG:   -25.92
                CBL-024         4B.05              2.077 KA      ANG:   -70.92

4B01.1          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

4B02.1          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

4B04.1          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

4B05.1          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

4C.01.0         E/Z:      3.060 KA AT  -75.68 DEG (  69.97 MVA)  X/R:     3.92
                SYM*1.6:    4.896 KA       MOMENTARY BASED ON X/R:    3.624 KA
                SYM*2.7:    8.263 KA           CREST BASED ON X/R:    6.269 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.6158 + J  2.4130  OHMS
                CBL-069         4C.01.1            0.000 KA      ANG:   -30.68
                CBL-067         0C                 3.060 KA      ANG:   -75.68

4C.01.1         E/Z:      3.060 KA AT  -75.68 DEG (  69.96 MVA)  X/R:     3.92
                SYM*1.6:    4.896 KA       MOMENTARY BASED ON X/R:    3.624 KA
                SYM*2.7:    8.262 KA           CREST BASED ON X/R:    6.269 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.6158 + J  2.4131  OHMS
                HEW 1 XFMR      4C01.1             0.000 KA      ANG:   -66.22
                CBL-069         4C.01.0            3.060 KA      ANG:   -75.68

4C.01.2         E/Z:      3.060 KA AT  -75.68 DEG (  69.96 MVA)  X/R:     3.92
                SYM*1.6:    4.896 KA       MOMENTARY BASED ON X/R:    3.624 KA
                SYM*2.7:    8.262 KA           CREST BASED ON X/R:    6.269 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.6158 + J  2.4131  OHMS
                HEW 2 XFMR      4C01.2             0.000 KA      ANG:  -153.16
                CBL-070         4C.01.0            3.060 KA      ANG:   -75.68

4C.02           E/Z:      2.995 KA AT  -74.04 DEG (  68.48 MVA)  X/R:     3.50
                SYM*1.6:    4.792 KA       MOMENTARY BASED ON X/R:    3.456 KA
                SYM*2.7:    8.087 KA           CREST BASED ON X/R:    5.960 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.6997 + J  2.4463  OHMS
                CBL-072         4C.02.1            0.000 KA      ANG:   -29.04
                CBL-068         4C.01.0            2.995 KA      ANG:   105.96
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THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

4C.02.1	E/Z:	2.995 KA AT -74.04 DEG (68.48 MVA)		X/R:	3.50
	SYM*1.6:	4.792 KA	MOMENTARY BASED ON X/R:		3.456 KA
	SYM*2.7:	8.087 KA	CREST BASED ON X/R:		5.960 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.6997 + J 2.4464 OHMS			
	TY 1 XFMR	4C02.1	0.000 KA	ANG:	-64.58
	CBL-072	4C.02	2.995 KA	ANG:	-74.04
4C.02.2	E/Z:	2.995 KA AT -74.04 DEG (68.48 MVA)		X/R:	3.50
	SYM*1.6:	4.792 KA	MOMENTARY BASED ON X/R:		3.456 KA
	SYM*2.7:	8.087 KA	CREST BASED ON X/R:		5.960 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.6997 + J 2.4464 OHMS			
	TY-2 XFMR	4C02.2	0.000 KA	ANG:	-87.36
	CBL-073	4C.02	2.995 KA	ANG:	-74.04
4C.03	E/Z:	2.923 KA AT -72.29 DEG (66.84 MVA)		X/R:	3.13
	SYM*1.6:	4.677 KA	MOMENTARY BASED ON X/R:		3.293 KA
	SYM*2.7:	7.893 KA	CREST BASED ON X/R:		5.650 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7932 + J 2.4833 OHMS			
	CBL-074	4C.04	0.000 KA	ANG:	-27.29
	CBL-071	4C.02	2.923 KA	ANG:	-72.29
4C.03.1	E/Z:	2.923 KA AT -72.29 DEG (66.84 MVA)		X/R:	3.13
	SYM*1.6:	4.677 KA	MOMENTARY BASED ON X/R:		3.293 KA
	SYM*2.7:	7.893 KA	CREST BASED ON X/R:		5.650 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.7932 + J 2.4834 OHMS			
	SEN XFMR	4C03.1	0.000 KA	ANG:	-150.98
	CBL-076	4C.03	2.923 KA	ANG:	-72.29
4C.04	E/Z:	2.914 KA AT -72.05 DEG (66.61 MVA)		X/R:	3.09
	SYM*1.6:	4.662 KA	MOMENTARY BASED ON X/R:		3.272 KA
	SYM*2.7:	7.867 KA	CREST BASED ON X/R:		5.610 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.8060 + J 2.4884 OHMS			
	CBL-077	4C.04.1	0.000 KA	ANG:	-27.05
	CBL-074	4C.03	2.914 KA	ANG:	107.95
4C.04.1	E/Z:	2.914 KA AT -72.05 DEG (66.61 MVA)		X/R:	3.09
	SYM*1.6:	4.662 KA	MOMENTARY BASED ON X/R:		3.272 KA
	SYM*2.7:	7.867 KA	CREST BASED ON X/R:		5.610 KA
	VOLTAGE:	13200. EQUIV. IMPEDANCE= 0.8060 + J 2.4884 OHMS			
	PATH XFMR	4C04.1	0.000 KA	ANG:	-27.05
	CBL-077	4C.04	2.914 KA	ANG:	-72.05
4C01.1	VOLTAGE:	208. (SEE LOW VOLTAGE REPORT)			

THREE PHASE MOMENTARY DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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4C01.2          VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

4C02.1          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

4C02.2          VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

4C03.1          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

4C04.1          VOLTAGE:    208.  ( SEE LOW VOLTAGE REPORT )

5C.01           E/Z:      3.277 KA AT  -82.03 DEG (  74.92 MVA)  X/R:     7.14
                SYM*1.6:    5.243 KA       MOMENTARY BASED ON X/R:    4.432 KA
                SYM*2.7:    8.847 KA           CREST BASED ON X/R:    7.618 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.3226 + J  2.3033  OHMS
                CBL-046         5C.01.1            0.000 KA      ANG:    83.61
                CBL-045         0C                 3.277 KA      ANG:  -262.03

5C.01.1         E/Z:      3.272 KA AT  -81.84 DEG (  74.81 MVA)  X/R:     6.97
                SYM*1.6:    5.236 KA       MOMENTARY BASED ON X/R:    4.405 KA
                SYM*2.7:    8.835 KA           CREST BASED ON X/R:    7.576 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.3307 + J  2.3054  OHMS
                PIEZ 1 XFMR     5C01.1             0.000 KA      ANG:  -180.45
                CBL-046         5C.01              3.272 KA      ANG:    98.16

5C.01.2         E/Z:      3.276 KA AT  -82.00 DEG (  74.90 MVA)  X/R:     7.12
                SYM*1.6:    5.241 KA       MOMENTARY BASED ON X/R:    4.428 KA
                SYM*2.7:    8.845 KA           CREST BASED ON X/R:    7.612 KA
                VOLTAGE:  13200.   EQUIV. IMPEDANCE=  0.3237 + J  2.3038  OHMS
                PIEZ 2 XFMR     5C01.2             0.000 KA      ANG:  -180.76
                CBL-047         5C.01              3.276 KA      ANG:  -262.00

5C01.1          VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

5C01.1.2        VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

5C01.2          VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

5C012.1         VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

G01             VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )

G01.1           VOLTAGE:    480.  ( SEE LOW VOLTAGE REPORT )
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T H R E E P H A S E M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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G01.1.2 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

G01.2 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

U N B A L A N C E D M O M E N T A R Y D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT TYPE	E/Z KA	X/R	EQUIVALENT IMPEDANCE (PU)	MOMENTARY FAULT DUTIES E/Z * 1.6	@ 0.5 CYCLE
	3P Duty:	6.30	7.2	Z1= 0.2655	10.08	8.54
0.000	SLG DUTY:	6.20	7.7	Z2= 0.2655	9.93	8.52
34500.	VOLTS LN/LN:	5.46		Z0= 0.2783		
	LN/LN/GND:	6.20 (	6.11	GND RETURN KA)		
	3P Duty:	6.30	7.1	Z1= 0.2657	10.08	8.51
0.01	SLG DUTY:	6.20	7.6	Z2= 0.2657	9.91	8.49
34500.	VOLTS LN/LN:	5.45		Z0= 0.2790		
	LN/LN/GND:	6.20 (	6.09	GND RETURN KA)		
	3P Duty:	6.30	7.1	Z1= 0.2657	10.08	8.51
0.02	SLG DUTY:	6.20	7.6	Z2= 0.2657	9.91	8.49
34500.	VOLTS LN/LN:	5.45		Z0= 0.2790		
	LN/LN/GND:	6.20 (	6.09	GND RETURN KA)		
	3P Duty:	6.30	7.1	Z1= 0.2657	10.08	8.51
0.03	SLG DUTY:	6.20	7.6	Z2= 0.2657	9.91	8.49
34500.	VOLTS LN/LN:	5.45		Z0= 0.2790		
	LN/LN/GND:	6.20 (	6.09	GND RETURN KA)		
	3P Duty:	2.51	12.8	Z1= 1.7451	4.01	3.74
0.1	SLG DUTY:	0.39	0.1	Z2= 1.7451	0.63	0.39
13200.	VOLTS LN/LN:	2.17		Z0= 32.8452		
	LN/LN/GND:	2.27 (	0.20	GND RETURN KA)		
	3P Duty:	2.51	12.8	Z1= 1.7458	4.01	3.74
0.1.1	SLG DUTY:	0.39	0.1	Z2= 1.7458	0.63	0.39
13200.	VOLTS LN/LN:	2.17		Z0= 32.8465		
	LN/LN/GND:	2.27 (	0.20	GND RETURN KA)		
	3P Duty:	2.41	8.7	Z1= 1.8112	3.86	3.39
0.1.2	SLG DUTY:	0.39	0.2	Z2= 1.8112	0.62	0.39
13200.	VOLTS LN/LN:	2.09		Z0= 32.9656		
	LN/LN/GND:	2.19 (	0.20	GND RETURN KA)		
	3P Duty:	2.51	12.8	Z1= 1.7451	4.01	3.74
0.2	SLG DUTY:	0.39	0.1	Z2= 1.7451	0.63	0.39
13200.	VOLTS LN/LN:	2.17		Z0= 32.8452		
	LN/LN/GND:	2.27 (	0.20	GND RETURN KA)		

U N B A L A N C E D M O M E N T A R Y D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT TYPE	E/Z KA	X/R	EQUIVALENT IMPEDANCE (PU)	MOMENTARY FAULT DUTIES E/Z * 1.6	@ 0.5 CYCLE
	3P Duty:	2.51	12.8	Z1= 1.7458	4.01	3.74
0.2.1	SLG DUTY:	0.39	0.1	Z2= 1.7458	0.63	0.39
13200.	VOLTS LN/LN:	2.17		Z0= 32.8465		
	LN/LN/GND:	2.27 (	0.20	GND RETURN KA)		
	3P Duty:	2.41	8.7	Z1= 1.8112	3.86	3.39
0.2.2	SLG DUTY:	0.39	0.2	Z2= 1.8112	0.62	0.39
13200.	VOLTS LN/LN:	2.09		Z0= 32.9656		
	LN/LN/GND:	2.19 (	0.20	GND RETURN KA)		
	3P Duty:	3.47	12.1	Z1= 1.2598	5.55	5.14
0.3	SLG DUTY:	0.39	0.1	Z2= 1.2598	0.63	0.39
13200.	VOLTS LN/LN:	3.01		Z0= 32.8861		
	LN/LN/GND:	3.11 (	0.20	GND RETURN KA)		
	3P Duty:	3.47	12.0	Z1= 1.2607	5.55	5.13
0.3.1	SLG DUTY:	0.39	0.1	Z2= 1.2607	0.63	0.39
13200.	VOLTS LN/LN:	3.00		Z0= 32.8877		
	LN/LN/GND:	3.10 (	0.20	GND RETURN KA)		
	3P Duty:	3.30	7.5	Z1= 1.3253	5.28	4.51
0.3.2	SLG DUTY:	0.39	0.1	Z2= 1.3253	0.63	0.39
13200.	VOLTS LN/LN:	2.86		Z0= 33.0021		
	LN/LN/GND:	2.96 (	0.20	GND RETURN KA)		
	3P Duty:	2.41	8.7	Z1= 1.8112	3.86	3.39
0A	SLG DUTY:	0.39	0.2	Z2= 1.8112	0.62	0.39
13200.	VOLTS LN/LN:	2.09		Z0= 32.9657		
	LN/LN/GND:	2.19 (	0.20	GND RETURN KA)		
	3P Duty:	2.41	8.7	Z1= 1.8112	3.86	3.39
0B	SLG DUTY:	0.39	0.2	Z2= 1.8112	0.62	0.39
13200.	VOLTS LN/LN:	2.09		Z0= 32.9657		
	LN/LN/GND:	2.19 (	0.20	GND RETURN KA)		
	3P Duty:	3.30	7.5	Z1= 1.3254	5.28	4.51
0C	SLG DUTY:	0.39	0.1	Z2= 1.3254	0.63	0.39
13200.	VOLTS LN/LN:	2.86		Z0= 33.0021		
	LN/LN/GND:	2.96 (	0.20	GND RETURN KA)		

U N B A L A N C E D M O M E N T A R Y D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT TYPE	E/Z KA	X/R	EQUIVALENT IMPEDANCE (PU)	MOMENTARY FAULT DUTIES E/Z * 1.6	@ 0.5 CYCLE
	3P Duty:	2.41	8.5	Z1= 1.8139	3.86	3.37
1A.01	SLG DUTY:	0.39	0.2	Z2= 1.8139	0.62	0.39
13200.	VOLTS LN/LN:	2.09		Z0= 32.9741		
	LN/LN/GND:	2.19 (	0.20	GND RETURN KA)		
	3P Duty:	2.41	8.2	Z1= 1.8176	3.85	3.34
1A.01A	SLG DUTY:	0.39	0.2	Z2= 1.8176	0.62	0.39
13200.	VOLTS LN/LN:	2.08		Z0= 32.9861		
	LN/LN/GND:	2.18 (	0.20	GND RETURN KA)		
	3P Duty:	2.41	8.2	Z1= 1.8177	3.85	3.34
1A.01A.1	SLG DUTY:	0.39	0.2	Z2= 1.8177	0.62	0.39
13200.	VOLTS LN/LN:	2.08		Z0= 32.9862		
	LN/LN/GND:	2.18 (	0.20	GND RETURN KA)		
	3P Duty:	2.41	8.2	Z1= 1.8177	3.85	3.34
1A.01A.2	SLG DUTY:	0.39	0.2	Z2= 1.8177	0.62	0.39
13200.	VOLTS LN/LN:	2.08		Z0= 32.9862		
	LN/LN/GND:	2.18 (	0.20	GND RETURN KA)		
	3P Duty:	2.30	5.1	Z1= 1.8982	3.69	2.90
1A.02	SLG DUTY:	0.38	0.2	Z2= 1.8982	0.61	0.38
13200.	VOLTS LN/LN:	2.00		Z0= 33.2270		
	LN/LN/GND:	2.09 (	0.20	GND RETURN KA)		
	3P Duty:	2.30	5.1	Z1= 1.8982	3.69	2.90
1A.02.1	SLG DUTY:	0.38	0.2	Z2= 1.8982	0.61	0.38
13200.	VOLTS LN/LN:	2.00		Z0= 33.2270		
	LN/LN/GND:	2.09 (	0.20	GND RETURN KA)		
	3P Duty:	2.28	4.7	Z1= 1.9199	3.65	2.81
1A.03	SLG DUTY:	0.38	0.2	Z2= 1.9199	0.61	0.38
13200.	VOLTS LN/LN:	1.97		Z0= 33.2872		
	LN/LN/GND:	2.07 (	0.20	GND RETURN KA)		
	3P Duty:	2.28	4.7	Z1= 1.9199	3.65	2.81
1A.03.1	SLG DUTY:	0.38	0.2	Z2= 1.9199	0.61	0.38
13200.	VOLTS LN/LN:	1.97		Z0= 33.2873		
	LN/LN/GND:	2.07 (	0.20	GND RETURN KA)		

U N B A L A N C E D M O M E N T A R Y D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT TYPE	E/Z KA	X/R	EQUIVALENT IMPEDANCE (PU)	MOMENTARY FAULT DUTIES E/Z * 1.6	@ 0.5 CYCLE
	3P Duty:	2.26	4.4	Z1= 1.9331	3.62	2.76
1A.04	SLG DUTY:	0.38	0.2	Z2= 1.9331	0.61	0.38
13200.	VOLTS LN/LN:	1.96		Z0= 33.3234		
	LN/LN/GND:	2.05 (	0.20	GND RETURN KA)		
	3P Duty:	2.26	4.4	Z1= 1.9332	3.62	2.76
1A.04.1	SLG DUTY:	0.38	0.2	Z2= 1.9332	0.61	0.38
13200.	VOLTS LN/LN:	1.96		Z0= 33.3235		
	LN/LN/GND:	2.05 (	0.20	GND RETURN KA)		
	3P Duty:	2.30	5.1	Z1= 1.8995	3.68	2.89
1B.01	SLG DUTY:	0.38	0.2	Z2= 1.8995	0.61	0.38
13200.	VOLTS LN/LN:	1.99		Z0= 33.2306		
	LN/LN/GND:	2.09 (	0.20	GND RETURN KA)		
	3P Duty:	2.30	5.1	Z1= 1.8995	3.68	2.89
1B.01.1	SLG DUTY:	0.38	0.2	Z2= 1.8995	0.61	0.38
13200.	VOLTS LN/LN:	1.99		Z0= 33.2306		
	LN/LN/GND:	2.09 (	0.20	GND RETURN KA)		
	3P Duty:	2.25	4.3	Z1= 1.9412	3.61	2.73
1B.02	SLG DUTY:	0.38	0.2	Z2= 1.9412	0.61	0.38
13200.	VOLTS LN/LN:	1.95		Z0= 33.3452		
	LN/LN/GND:	2.04 (	0.20	GND RETURN KA)		
	3P Duty:	2.25	4.3	Z1= 1.9412	3.61	2.73
1B.02.1	SLG DUTY:	0.38	0.2	Z2= 1.9412	0.61	0.38
13200.	VOLTS LN/LN:	1.95		Z0= 33.3452		
	LN/LN/GND:	2.04 (	0.20	GND RETURN KA)		
	3P Duty:	2.23	4.1	Z1= 1.9570	3.58	2.67
1B.03	SLG DUTY:	0.38	0.2	Z2= 1.9570	0.60	0.38
13200.	VOLTS LN/LN:	1.94		Z0= 33.3874		
	LN/LN/GND:	2.03 (	0.19	GND RETURN KA)		
	3P Duty:	2.23	4.1	Z1= 1.9571	3.58	2.67
1B.03.1	SLG DUTY:	0.38	0.2	Z2= 1.9571	0.60	0.38
13200.	VOLTS LN/LN:	1.94		Z0= 33.3875		
	LN/LN/GND:	2.03 (	0.19	GND RETURN KA)		

U N B A L A N C E D M O M E N T A R Y D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT TYPE	E/Z KA	X/R	EQUIVALENT IMPEDANCE (PU)	MOMENTARY FAULT DUTIES E/Z * 1.6	@ 0.5 CYCLE
	3P Duty:	2.34	5.9	Z1= 1.8660	3.75	3.05
2A.01	SLG DUTY:	0.38	0.2	Z2= 1.8660	0.61	0.38
13200.	VOLTS LN/LN:	2.03		Z0= 33.1342		
	LN/LN/GND:	2.13 (	0.20	GND RETURN KA)		
	3P Duty:	2.34	5.9	Z1= 1.8660	3.75	3.05
2A.01.1	SLG DUTY:	0.38	0.2	Z2= 1.8660	0.61	0.38
13200.	VOLTS LN/LN:	2.03		Z0= 33.1342		
	LN/LN/GND:	2.13 (	0.20	GND RETURN KA)		
	3P Duty:	2.29	4.8	Z1= 1.9137	3.66	2.83
2A.02	SLG DUTY:	0.38	0.2	Z2= 1.9137	0.61	0.38
13200.	VOLTS LN/LN:	1.98		Z0= 33.2704		
	LN/LN/GND:	2.07 (	0.20	GND RETURN KA)		
	3P Duty:	2.29	4.8	Z1= 1.9138	3.66	2.83
2A.02.1	SLG DUTY:	0.38	0.2	Z2= 1.9138	0.61	0.38
13200.	VOLTS LN/LN:	1.98		Z0= 33.2704		
	LN/LN/GND:	2.07 (	0.20	GND RETURN KA)		
	3P Duty:	2.25	4.3	Z1= 1.9403	3.61	2.73
2A.03	SLG DUTY:	0.38	0.2	Z2= 1.9403	0.61	0.38
13200.	VOLTS LN/LN:	1.95		Z0= 33.3427		
	LN/LN/GND:	2.05 (	0.20	GND RETURN KA)		
	3P Duty:	2.25	4.3	Z1= 1.9403	3.61	2.73
2A.03.1	SLG DUTY:	0.38	0.2	Z2= 1.9403	0.61	0.38
13200.	VOLTS LN/LN:	1.95		Z0= 33.3428		
	LN/LN/GND:	2.05 (	0.20	GND RETURN KA)		
	3P Duty:	3.07	4.0	Z1= 1.4228	4.92	3.66
2C.01	SLG DUTY:	0.38	0.1	Z2= 1.4228	0.61	0.38
13200.	VOLTS LN/LN:	2.66		Z0= 33.2767		
	LN/LN/GND:	2.76 (	0.20	GND RETURN KA)		
	3P Duty:	3.07	4.0	Z1= 1.4228	4.92	3.66
2C.01.1	SLG DUTY:	0.38	0.1	Z2= 1.4228	0.61	0.38
13200.	VOLTS LN/LN:	2.66		Z0= 33.2768		
	LN/LN/GND:	2.76 (	0.20	GND RETURN KA)		

U N B A L A N C E D M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT TYPE	E/Z KA	X/R	EQUIVALENT IMPEDANCE (PU)	MOMENTARY FAULT DUTIES E/Z * 1.6	@ 0.5 CYCLE
	3P Duty:	3.03	3.7	Z1= 1.4414	4.86	3.55
2C.02	SLG DUTY:	0.38	0.1	Z2= 1.4414	0.61	0.38
13200.	VOLTS LN/LN:	2.63		Z0= 33.3246		
	LN/LN/GND:	2.72 (	0.20	GND RETURN KA)		
	3P Duty:	3.03	3.7	Z1= 1.4415	4.85	3.55
2C.02.1	SLG DUTY:	0.38	0.1	Z2= 1.4415	0.61	0.38
13200.	VOLTS LN/LN:	2.63		Z0= 33.3246		
	LN/LN/GND:	2.72 (	0.20	GND RETURN KA)		
	3P Duty:	2.98	3.4	Z1= 1.4653	4.78	3.43
2C.03	SLG DUTY:	0.38	0.1	Z2= 1.4653	0.61	0.38
13200.	VOLTS LN/LN:	2.59		Z0= 33.3844		
	LN/LN/GND:	2.68 (	0.20	GND RETURN KA)		
	3P Duty:	2.98	3.4	Z1= 1.4653	4.78	3.43
2C.03.1	SLG DUTY:	0.38	0.1	Z2= 1.4653	0.61	0.38
13200.	VOLTS LN/LN:	2.58		Z0= 33.3844		
	LN/LN/GND:	2.68 (	0.20	GND RETURN KA)		
	3P Duty:	2.98	3.4	Z1= 1.4653	4.78	3.43
2C.03.2	SLG DUTY:	0.38	0.1	Z2= 1.4653	0.61	0.38
13200.	VOLTS LN/LN:	2.58		Z0= 33.3844		
	LN/LN/GND:	2.68 (	0.20	GND RETURN KA)		
	3P Duty:	2.89	3.0	Z1= 1.5125	4.63	3.23
2C.04	SLG DUTY:	0.38	0.1	Z2= 1.5125	0.61	0.38
13200.	VOLTS LN/LN:	2.50		Z0= 33.4982		
	LN/LN/GND:	2.59 (	0.19	GND RETURN KA)		
	3P Duty:	2.89	3.0	Z1= 1.5125	4.63	3.23
2C.04.1	SLG DUTY:	0.38	0.1	Z2= 1.5125	0.61	0.38
13200.	VOLTS LN/LN:	2.50		Z0= 33.4982		
	LN/LN/GND:	2.59 (	0.19	GND RETURN KA)		
	3P Duty:	2.29	4.9	Z1= 1.9068	3.67	2.86
3B.01	SLG DUTY:	0.38	0.2	Z2= 1.9068	0.61	0.38
13200.	VOLTS LN/LN:	1.99		Z0= 33.2511		
	LN/LN/GND:	2.08 (	0.20	GND RETURN KA)		

U N B A L A N C E D M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT TYPE	E/Z KA	X/R	EQUIVALENT IMPEDANCE (PU)	MOMENTARY FAULT DUTIES E/Z * 1.6	@ 0.5 CYCLE
	3P Duty:	2.29	4.9	Z1= 1.9068	3.67	2.86
3B.01.1	SLG DUTY:	0.38	0.2	Z2= 1.9068	0.61	0.38
13200.	VOLTS LN/LN:	1.99		Z0= 33.2511		
	LN/LN/GND:	2.08 (	0.20	GND RETURN KA)		
	3P Duty:	2.28	4.6	Z1= 1.9212	3.64	2.80
3B.02	SLG DUTY:	0.38	0.2	Z2= 1.9212	0.61	0.38
13200.	VOLTS LN/LN:	1.97		Z0= 33.2909		
	LN/LN/GND:	2.07 (	0.20	GND RETURN KA)		
	3P Duty:	2.28	4.6	Z1= 1.9212	3.64	2.80
3B.02.1	SLG DUTY:	0.38	0.2	Z2= 1.9212	0.61	0.38
13200.	VOLTS LN/LN:	1.97		Z0= 33.2909		
	LN/LN/GND:	2.07 (	0.20	GND RETURN KA)		
	3P Duty:	2.26	4.4	Z1= 1.9358	3.62	2.75
3B.03	SLG DUTY:	0.38	0.2	Z2= 1.9358	0.61	0.38
13200.	VOLTS LN/LN:	1.96		Z0= 33.3307		
	LN/LN/GND:	2.05 (	0.20	GND RETURN KA)		
	3P Duty:	2.26	4.4	Z1= 1.9358	3.62	2.75
3B.03.1	SLG DUTY:	0.38	0.2	Z2= 1.9358	0.61	0.38
13200.	VOLTS LN/LN:	1.96		Z0= 33.3307		
	LN/LN/GND:	2.05 (	0.20	GND RETURN KA)		
	3P Duty:	2.21	3.8	Z1= 1.9804	3.53	2.60
3B.04	SLG DUTY:	0.38	0.2	Z2= 1.9804	0.60	0.38
13200.	VOLTS LN/LN:	1.91		Z0= 33.4484		
	LN/LN/GND:	2.00 (	0.19	GND RETURN KA)		
	3P Duty:	2.21	3.8	Z1= 1.9804	3.53	2.60
3B.04.1	SLG DUTY:	0.38	0.2	Z2= 1.9804	0.60	0.38
13200.	VOLTS LN/LN:	1.91		Z0= 33.4484		
	LN/LN/GND:	2.00 (	0.19	GND RETURN KA)		
	3P Duty:	3.07	4.0	Z1= 1.4251	4.91	3.65
3C.01	SLG DUTY:	0.38	0.1	Z2= 1.4251	0.61	0.38
13200.	VOLTS LN/LN:	2.66		Z0= 33.2827		
	LN/LN/GND:	2.75 (	0.20	GND RETURN KA)		

U N B A L A N C E D M O M E N T A R Y D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT TYPE	E/Z KA	X/R	EQUIVALENT IMPEDANCE (PU)	MOMENTARY FAULT DUTIES E/Z * 1.6	@ 0.5 CYCLE
	3P Duty:	3.07	4.0	Z1= 1.4251	4.91	3.65
3C.01.1	SLG DUTY:	0.38	0.1	Z2= 1.4251	0.61	0.38
13200.	VOLTS LN/LN:	2.66		Z0= 33.2828		
	LN/LN/GND:	2.75 (	0.20	GND RETURN KA)		
	3P Duty:	2.98	3.4	Z1= 1.4702	4.76	3.41
3C.02	SLG DUTY:	0.38	0.1	Z2= 1.4702	0.61	0.38
13200.	VOLTS LN/LN:	2.58		Z0= 33.3964		
	LN/LN/GND:	2.67 (	0.20	GND RETURN KA)		
	3P Duty:	2.98	3.4	Z1= 1.4702	4.76	3.41
3C.02.1	SLG DUTY:	0.38	0.1	Z2= 1.4702	0.61	0.38
13200.	VOLTS LN/LN:	2.58		Z0= 33.3964		
	LN/LN/GND:	2.67 (	0.20	GND RETURN KA)		
	3P Duty:	2.95	3.3	Z1= 1.4824	4.72	3.35
3C.03	SLG DUTY:	0.38	0.1	Z2= 1.4824	0.61	0.38
13200.	VOLTS LN/LN:	2.56		Z0= 33.4263		
	LN/LN/GND:	2.65 (	0.19	GND RETURN KA)		
	3P Duty:	2.95	3.3	Z1= 1.4825	4.72	3.35
3C.03.1	SLG DUTY:	0.38	0.1	Z2= 1.4825	0.61	0.38
13200.	VOLTS LN/LN:	2.56		Z0= 33.4263		
	LN/LN/GND:	2.65 (	0.19	GND RETURN KA)		
	3P Duty:	2.85	2.8	Z1= 1.5347	4.56	3.15
3C.04	SLG DUTY:	0.38	0.1	Z2= 1.5347	0.60	0.38
13200.	VOLTS LN/LN:	2.47		Z0= 33.5498		
	LN/LN/GND:	2.56 (	0.19	GND RETURN KA)		
	3P Duty:	2.85	2.8	Z1= 1.5347	4.56	3.15
3C.04.1	SLG DUTY:	0.38	0.1	Z2= 1.5347	0.60	0.38
13200.	VOLTS LN/LN:	2.47		Z0= 33.5499		
	LN/LN/GND:	2.56 (	0.19	GND RETURN KA)		
	3P Duty:	2.18	3.5	Z1= 2.0095	3.48	2.52
4B.01	SLG DUTY:	0.37	0.2	Z2= 2.0095	0.60	0.37
13200.	VOLTS LN/LN:	1.88		Z0= 33.5227		
	LN/LN/GND:	1.98 (	0.19	GND RETURN KA)		

U N B A L A N C E D M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT TYPE	E/Z KA	X/R	EQUIVALENT IMPEDANCE (PU)	MOMENTARY FAULT DUTIES E/Z * 1.6	@ 0.5 CYCLE
	3P Duty:	2.18	3.5	Z1= 2.0095	3.48	2.52
4B.01.1	SLG DUTY:	0.37	0.2	Z2= 2.0095	0.60	0.37
13200.	VOLTS LN/LN:	1.88		Z0= 33.5228		
	LN/LN/GND:	1.98 (	0.19	GND RETURN KA)		
	3P Duty:	2.13	3.2	Z1= 2.0495	3.41	2.42
4B.02	SLG DUTY:	0.37	0.2	Z2= 2.0495	0.60	0.37
13200.	VOLTS LN/LN:	1.85		Z0= 33.6219		
	LN/LN/GND:	1.94 (	0.19	GND RETURN KA)		
	3P Duty:	2.13	3.2	Z1= 2.0495	3.41	2.42
4B.02.1	SLG DUTY:	0.37	0.2	Z2= 2.0495	0.60	0.37
13200.	VOLTS LN/LN:	1.85		Z0= 33.6219		
	LN/LN/GND:	1.94 (	0.19	GND RETURN KA)		
	3P Duty:	2.11	3.1	Z1= 2.0714	3.38	2.37
4B.04	SLG DUTY:	0.37	0.2	Z2= 2.0714	0.59	0.37
13200.	VOLTS LN/LN:	1.83		Z0= 33.6751		
	LN/LN/GND:	1.92 (	0.19	GND RETURN KA)		
	3P Duty:	2.11	3.1	Z1= 2.0715	3.38	2.37
4B.04.1	SLG DUTY:	0.37	0.2	Z2= 2.0715	0.59	0.37
13200.	VOLTS LN/LN:	1.83		Z0= 33.6752		
	LN/LN/GND:	1.92 (	0.19	GND RETURN KA)		
	3P Duty:	2.08	2.9	Z1= 2.1058	3.32	2.30
4B.05	SLG DUTY:	0.37	0.2	Z2= 2.1058	0.59	0.37
13200.	VOLTS LN/LN:	1.80		Z0= 33.7569		
	LN/LN/GND:	1.89 (	0.19	GND RETURN KA)		
	3P Duty:	2.08	2.9	Z1= 2.1059	3.32	2.30
4B.05.1	SLG DUTY:	0.37	0.2	Z2= 2.1059	0.59	0.37
13200.	VOLTS LN/LN:	1.80		Z0= 33.7569		
	LN/LN/GND:	1.89 (	0.19	GND RETURN KA)		
	3P Duty:	3.06	3.9	Z1= 1.4293	4.90	3.62
4C.01.0	SLG DUTY:	0.38	0.1	Z2= 1.4293	0.61	0.38
13200.	VOLTS LN/LN:	2.65		Z0= 33.2935		
	LN/LN/GND:	2.74 (	0.20	GND RETURN KA)		

U N B A L A N C E D M O M E N T A R Y D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT TYPE	E/Z KA	X/R	EQUIVALENT IMPEDANCE (PU)	MOMENTARY FAULT DUTIES E/Z * 1.6	@ 0.5 CYCLE
	3P Duty:	3.06	3.9	Z1= 1.4293	4.90	3.62
4C.01.1	SLG DUTY:	0.38	0.1	Z2= 1.4293	0.61	0.38
13200.	VOLTS LN/LN:	2.65		Z0= 33.2935		
	LN/LN/GND:	2.74 (	0.20	GND RETURN KA)		
	3P Duty:	3.06	3.9	Z1= 1.4293	4.90	3.62
4C.01.2	SLG DUTY:	0.38	0.1	Z2= 1.4293	0.61	0.38
13200.	VOLTS LN/LN:	2.65		Z0= 33.2935		
	LN/LN/GND:	2.74 (	0.20	GND RETURN KA)		
	3P Duty:	3.00	3.5	Z1= 1.4603	4.79	3.46
4C.02	SLG DUTY:	0.38	0.1	Z2= 1.4603	0.61	0.38
13200.	VOLTS LN/LN:	2.59		Z0= 33.3720		
	LN/LN/GND:	2.69 (	0.20	GND RETURN KA)		
	3P Duty:	3.00	3.5	Z1= 1.4603	4.79	3.46
4C.02.1	SLG DUTY:	0.38	0.1	Z2= 1.4603	0.61	0.38
13200.	VOLTS LN/LN:	2.59		Z0= 33.3720		
	LN/LN/GND:	2.69 (	0.20	GND RETURN KA)		
	3P Duty:	3.00	3.5	Z1= 1.4603	4.79	3.46
4C.02.2	SLG DUTY:	0.38	0.1	Z2= 1.4603	0.61	0.38
13200.	VOLTS LN/LN:	2.59		Z0= 33.3720		
	LN/LN/GND:	2.69 (	0.20	GND RETURN KA)		
	3P Duty:	2.92	3.1	Z1= 1.4962	4.68	3.29
4C.03	SLG DUTY:	0.38	0.1	Z2= 1.4962	0.61	0.38
13200.	VOLTS LN/LN:	2.53		Z0= 33.4594		
	LN/LN/GND:	2.62 (	0.19	GND RETURN KA)		
	3P Duty:	2.92	3.1	Z1= 1.4962	4.68	3.29
4C.03.1	SLG DUTY:	0.38	0.1	Z2= 1.4962	0.61	0.38
13200.	VOLTS LN/LN:	2.53		Z0= 33.4594		
	LN/LN/GND:	2.62 (	0.19	GND RETURN KA)		
	3P Duty:	2.91	3.1	Z1= 1.5012	4.66	3.27
4C.04	SLG DUTY:	0.38	0.1	Z2= 1.5012	0.61	0.38
13200.	VOLTS LN/LN:	2.52		Z0= 33.4713		
	LN/LN/GND:	2.61 (	0.19	GND RETURN KA)		

U N B A L A N C E D M O M E N T A R Y D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

LOCATION VOLTAGE	FAULT TYPE	E/Z KA	X/R	EQUIVALENT IMPEDANCE (PU)	MOMENTARY FAULT DUTIES E/Z * 1.6	@ 0.5 CYCLE
	3P Duty:	2.91	3.1	Z1= 1.5012	4.66	3.27
4C.04.1	SLG DUTY:	0.38	0.1	Z2= 1.5012	0.61	0.38
13200.	VOLTS LN/LN:	2.52		Z0= 33.4714		
	LN/LN/GND:	2.61 (	0.19	GND RETURN KA)		
	3P Duty:	3.28	7.1	Z1= 1.3348	5.24	4.43
5C.01	SLG DUTY:	0.39	0.1	Z2= 1.3348	0.63	0.39
13200.	VOLTS LN/LN:	2.84		Z0= 33.0203		
	LN/LN/GND:	2.93 (	0.20	GND RETURN KA)		
	3P Duty:	3.27	7.0	Z1= 1.3367	5.24	4.40
5C.01.1	SLG DUTY:	0.39	0.1	Z2= 1.3367	0.62	0.39
13200.	VOLTS LN/LN:	2.83		Z0= 33.0295		
	LN/LN/GND:	2.93 (	0.20	GND RETURN KA)		
	3P Duty:	3.28	7.1	Z1= 1.3352	5.24	4.43
5C.01.2	SLG DUTY:	0.39	0.1	Z2= 1.3352	0.63	0.39
13200.	VOLTS LN/LN:	2.84		Z0= 33.0218		
	LN/LN/GND:	2.93 (	0.20	GND RETURN KA)		

M O M E N T A R Y D U T Y S U M M A R Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
SOLUTION METHOD : E/Z

BUS RECORD NO NAME	VOLTAGE L-L	* 3 P H A S E * KA	X/R	* * * SLG * * * KA	X/R
0.000	34500.	8.535	7.18	8.521	7.72
0.01	34500.	8.513	7.11	8.493	7.64
0.02	34500.	8.513	7.11	8.493	7.64
0.03	34500.	8.513	7.11	8.493	7.64
0.1	13200.	3.740	12.85	0.392	0.15
0.1.1	13200.	3.736	12.78	0.392	0.15
0.1.2	13200.	3.391	8.70	0.389	0.16
0.2	13200.	3.740	12.85	0.392	0.15
0.2.1	13200.	3.736	12.78	0.392	0.15
0.2.2	13200.	3.391	8.70	0.389	0.16
0.3	13200.	5.135	12.06	0.394	0.11
0.3.1	13200.	5.126	11.96	0.394	0.11
0.3.2	13200.	4.513	7.54	0.391	0.11
0A	13200.	3.390	8.70	0.389	0.16
0B	13200.	3.390	8.70	0.389	0.16
0C	13200.	4.512	7.54	0.391	0.11
1A.01	13200.	3.371	8.50	0.389	0.16
1A.01A	13200.	3.345	8.23	0.388	0.16
1A.01A.1	13200.	3.344	8.23	0.388	0.16
1A.01A.2	13200.	3.344	8.23	0.388	0.16
1A.02	13200.	2.898	5.09	0.382	0.16
1A.02.1	13200.	2.898	5.09	0.382	0.16
1A.03	13200.	2.808	4.66	0.380	0.16
1A.03.1	13200.	2.808	4.66	0.380	0.16
1A.04	13200.	2.757	4.44	0.379	0.16
1A.04.1	13200.	2.757	4.44	0.379	0.16
1B.01	13200.	2.892	5.06	0.382	0.16
1B.01.1	13200.	2.892	5.06	0.382	0.16
1B.02	13200.	2.728	4.31	0.379	0.17
1B.02.1	13200.	2.728	4.31	0.379	0.17
1B.03	13200.	2.674	4.10	0.378	0.17
1B.03.1	13200.	2.674	4.10	0.378	0.17
2A.01	13200.	3.051	5.94	0.384	0.16
2A.01.1	13200.	3.051	5.94	0.384	0.16
2A.02	13200.	2.832	4.77	0.381	0.16
2A.02.1	13200.	2.832	4.77	0.381	0.16
2A.03	13200.	2.732	4.33	0.379	0.17
2A.03.1	13200.	2.732	4.33	0.379	0.17
2C.01	13200.	3.663	4.02	0.384	0.12
2C.01.1	13200.	3.663	4.02	0.384	0.12
2C.02	13200.	3.555	3.74	0.383	0.12
2C.02.1	13200.	3.555	3.74	0.383	0.12
2C.03	13200.	3.432	3.44	0.381	0.12
2C.03.1	13200.	3.431	3.44	0.381	0.12
2C.03.2	13200.	3.431	3.44	0.381	0.12

2C.04	13200.	3.227	2.99	0.378	0.13
2C.04.1	13200.	3.227	2.99	0.378	0.13

M O M E N T A R Y D U T Y S U M M A R Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
SOLUTION METHOD : E/Z

BUS RECORD NO NAME	VOLTAGE L-L	* 3 P H A S E * KA	X/R	* * * SLG * * * KA	X/R
3B.01	13200.	2.861	4.90	0.381	0.16
3B.01.1	13200.	2.861	4.90	0.381	0.16
3B.02	13200.	2.803	4.63	0.380	0.16
3B.02.1	13200.	2.803	4.63	0.380	0.16
3B.03	13200.	2.748	4.40	0.379	0.16
3B.03.1	13200.	2.748	4.40	0.379	0.16
3B.04	13200.	2.601	3.82	0.376	0.17
3B.04.1	13200.	2.601	3.82	0.376	0.17
3C.01	13200.	3.649	3.99	0.384	0.12
3C.01.1	13200.	3.649	3.99	0.384	0.12
3C.02	13200.	3.408	3.38	0.381	0.12
3C.02.1	13200.	3.408	3.38	0.381	0.12
3C.03	13200.	3.352	3.26	0.380	0.12
3C.03.1	13200.	3.352	3.26	0.380	0.12
3C.04	13200.	3.145	2.83	0.377	0.13
3C.04.1	13200.	3.145	2.83	0.377	0.13
4B.01	13200.	2.519	3.54	0.374	0.17
4B.01.1	13200.	2.519	3.54	0.374	0.17
4B.02	13200.	2.420	3.23	0.372	0.17
4B.02.1	13200.	2.420	3.23	0.372	0.17
4B.04	13200.	2.371	3.08	0.371	0.17
4B.04.1	13200.	2.371	3.08	0.371	0.17
4B.05	13200.	2.301	2.89	0.369	0.17
4B.05.1	13200.	2.301	2.89	0.369	0.17
4C.01.0	13200.	3.624	3.92	0.383	0.12
4C.01.1	13200.	3.624	3.92	0.383	0.12
4C.01.2	13200.	3.624	3.92	0.383	0.12
4C.02	13200.	3.456	3.50	0.381	0.12
4C.02.1	13200.	3.456	3.50	0.381	0.12
4C.02.2	13200.	3.456	3.50	0.381	0.12
4C.03	13200.	3.293	3.13	0.379	0.12
4C.03.1	13200.	3.293	3.13	0.379	0.12
4C.04	13200.	3.272	3.09	0.379	0.12
4C.04.1	13200.	3.272	3.09	0.379	0.12
5C.01	13200.	4.432	7.14	0.391	0.11
5C.01.1	13200.	4.405	6.97	0.390	0.11
5C.01.2	13200.	4.428	7.12	0.391	0.11

84 FAULTED BUSES, 134 BRANCHES, 2 CONTRIBUTIONS
UNBALANCED FAULTS REQUESTED

*** SHORT CIRCUIT STUDY COMPLETE ***

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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0.000 E/Z: 6.303 KA AT -82.07 DEG (376.64 MVA) X/R: 7.18
VOLTAGE: 34500. EQUIV. IMPEDANCE= 0.4359 + J 3.1300 OHMS
CONTRIBUTIONS: NMPC 6.303 KA ANG: -82.07

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	6.303	0.00	R

TOTAL REMOTE: 6.303 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	6.303	6.303	6.303	6.303

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.121	1.010	1.000	1.000
DUTY (KA) :	7.069	6.366	6.303	6.303

0.01 E/Z: 6.299 KA AT -82.00 DEG (376.39 MVA) X/R: 7.11
VOLTAGE: 34500. EQUIV. IMPEDANCE= 0.4402 + J 3.1315 OHMS
CONTRIBUTIONS: 0.000 6.299 KA ANG: -82.00

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	6.299	0.00	R

TOTAL REMOTE: 6.299 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	6.299	6.299	6.299	6.299

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.119	1.009	1.000	1.000
DUTY (KA) :	7.051	6.355	6.299	6.299

0.02 E/Z: 6.299 KA AT -82.00 DEG (376.39 MVA) X/R: 7.11
VOLTAGE: 34500. EQUIV. IMPEDANCE= 0.4402 + J 3.1315 OHMS
CONTRIBUTIONS: 0.000 6.299 KA ANG: -82.00

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	6.299	0.00	R

TOTAL REMOTE: 6.299 KA NACD RATIO: 1.0000

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	6.299	6.299	6.299	6.299

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.119	1.009	1.000	1.000
DUTY (KA) :	7.051	6.355	6.299	6.299

0.03 E/Z: 6.299 KA AT -82.00 DEG (376.39 MVA) X/R: 7.11
VOLTAGE: 34500. EQUIV. IMPEDANCE= 0.4402 + J 3.1315 OHMS
CONTRIBUTIONS: 0.000 6.299 KA ANG: -82.00

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	6.299	0.00	R

TOTAL REMOTE: 6.299 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	6.299	6.299	6.299	6.299

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.119	1.009	1.000	1.000
DUTY (KA) :	7.051	6.355	6.299	6.299

0.1 E/Z: 2.506 KA AT -85.55 DEG (57.30 MVA) X/R: 12.85
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.2360 + J 3.0315 OHMS
CONTRIBUTIONS: 0.01 2.506 KA ANG: 94.45

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.506	0.85	R

TOTAL REMOTE: 2.506 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.026
DUTY (KA) :	2.506	2.506	2.506	2.572

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.281	1.113	1.041	1.001
DUTY (KA) :	3.211	2.789	2.610	2.510

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

0.1.1 E/Z: 2.505 KA AT -85.53 DEG (57.28 MVA) X/R: 12.78
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.2373 + J 3.0326 OHMS
CBL-001 0.1 2.505 KA ANG: -85.53

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.505	0.85	R

TOTAL REMOTE: 2.505 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.026
DUTY (KA) :	2.505	2.505	2.505	2.570

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.279	1.111	1.040	1.001
DUTY (KA) :	3.205	2.784	2.606	2.508

0.1.2 E/Z: 2.415 KA AT -83.44 DEG (55.21 MVA) X/R: 8.70
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.3604 + J 3.1352 OHMS
CBL-002 0.1.1 2.415 KA ANG: 96.56

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.415	0.85	R

TOTAL REMOTE: 2.415 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.002
DUTY (KA) :	2.415	2.415	2.415	2.420

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.169	1.034	1.001	1.000
DUTY (KA) :	2.823	2.496	2.417	2.415

0.2 E/Z: 2.506 KA AT -85.55 DEG (57.30 MVA) X/R: 12.85
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.2360 + J 3.0315 OHMS
CONTRIBUTIONS: 0.02 2.506 KA ANG: 94.45

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.506	0.85	R

TOTAL REMOTE: 2.506 KA NACD RATIO: 1.0000

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.026
DUTY (KA) :	2.506	2.506	2.506	2.572

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.281	1.113	1.041	1.001
DUTY (KA) :	3.211	2.789	2.610	2.510

0.2.1 E/Z: 2.505 KA AT -85.53 DEG (57.28 MVA) X/R: 12.78
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.2373 + J 3.0326 OHMS
CBL-079 0.2 2.505 KA ANG: -85.53

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.505	0.85	R

TOTAL REMOTE: 2.505 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.026
DUTY (KA) :	2.505	2.505	2.505	2.570

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.279	1.111	1.040	1.001
DUTY (KA) :	3.205	2.784	2.606	2.508

0.2.2 E/Z: 2.415 KA AT -83.44 DEG (55.21 MVA) X/R: 8.70
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.3604 + J 3.1352 OHMS
CBL-080 0.2.1 2.415 KA ANG: 96.56

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.415	0.85	R

TOTAL REMOTE: 2.415 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.002
DUTY (KA) :	2.415	2.415	2.415	2.420

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.169	1.034	1.001	1.000
DUTY (KA) :	2.823	2.496	2.417	2.415

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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0.3 E/Z: 3.472 KA AT -85.26 DEG (79.38 MVA) X/R: 12.06
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.1814 + J 2.1876 OHMS
CONTRIBUTIONS: 0.03 3.472 KA ANG: -265.26

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 3.472 0.79 R
TOTAL REMOTE: 3.472 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.020
DUTY (KA) :	3.472	3.472	3.472	3.541

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.261	1.096	1.032	1.000
DUTY (KA) :	4.379	3.806	3.582	3.472

0.3.1 E/Z: 3.469 KA AT -85.22 DEG (79.32 MVA) X/R: 11.96
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.1831 + J 2.1889 OHMS
CBL-082 0.3 3.469 KA ANG: -85.22

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 3.469 0.79 R
TOTAL REMOTE: 3.469 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.019
DUTY (KA) :	3.469	3.469	3.469	3.536

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.259	1.094	1.030	1.000
DUTY (KA) :	4.368	3.797	3.575	3.469

0.3.2 E/Z: 3.300 KA AT -82.45 DEG (75.45 MVA) X/R: 7.54
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.3034 + J 2.2893 OHMS
CBL-083 0.3.1 3.300 KA ANG: -262.45

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 3.300 0.80 R
TOTAL REMOTE: 3.300 KA NACD RATIO: 1.0000

THREE PHASE INTERRUPTING DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	3.300	3.300	3.300	3.300

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.133	1.016	1.000	1.000
DUTY (KA) :	3.739	3.352	3.300	3.300

0A E/Z: 2.415 KA AT -83.44 DEG (55.21 MVA) X/R: 8.70
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.3604 + J 3.1353 OHMS
CBL-081 0.2.2 2.415 KA ANG: 96.56

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.415	0.85	R

TOTAL REMOTE: 2.415 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.002
DUTY (KA) :	2.415	2.415	2.415	2.419

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.169	1.034	1.001	1.000
DUTY (KA) :	2.823	2.496	2.417	2.415

0B E/Z: 2.415 KA AT -83.44 DEG (55.21 MVA) X/R: 8.70
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.3604 + J 3.1353 OHMS
CBL-003 0.1.2 2.415 KA ANG: 96.56

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.415	0.85	R

TOTAL REMOTE: 2.415 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.002
DUTY (KA) :	2.415	2.415	2.415	2.419

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

		TOT2	TOT3	TOT5	TOT8
	MULT. FACT:	1.169	1.034	1.001	1.000
	DUTY (KA) :	2.823	2.496	2.417	2.415

0C E/Z: 3.300 KA AT -82.45 DEG (75.45 MVA) X/R: 7.54
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.3034 + J 2.2893 OHMS
CBL-084 0.3.2 3.300 KA ANG: -82.45

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	3.300	0.80	R

TOTAL REMOTE: 3.300 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	3.300	3.300	3.300	3.300

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.133	1.016	1.000	1.000
DUTY (KA) :	3.739	3.352	3.300	3.300

1A.01 E/Z: 2.411 KA AT -83.29 DEG (55.13 MVA) X/R: 8.50
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.3694 + J 3.1388 OHMS
CONTRIBUTIONS: 0A 2.411 KA ANG: -83.29

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.411	0.85	R

TOTAL REMOTE: 2.411 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.002
DUTY (KA) :	2.411	2.411	2.411	2.415

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.163	1.031	1.000	1.000
DUTY (KA) :	2.804	2.485	2.411	2.411

THREE PHASE INTERRUPTING DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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1A.01A E/Z: 2.406 KA AT -83.07 DEG (55.02 MVA) X/R: 8.23
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.3822 + J 3.1439 OHMS
CONTRIBUTIONS: 1A.01 2.406 KA ANG: -83.07

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.406	0.85	R

TOTAL REMOTE: 2.406 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.001
DUTY (KA) :	2.406	2.406	2.406	2.409

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.154	1.026	1.000	1.000
DUTY (KA) :	2.778	2.470	2.406	2.406

1A.01A.1 E/Z: 2.406 KA AT -83.07 DEG (55.02 MVA) X/R: 8.23
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.3822 + J 3.1439 OHMS
CONTRIBUTIONS: 1A.01A 2.406 KA ANG: 96.93

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.406	0.85	R

TOTAL REMOTE: 2.406 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.001
DUTY (KA) :	2.406	2.406	2.406	2.409

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.154	1.026	1.000	1.000
DUTY (KA) :	2.778	2.470	2.406	2.406

1A.01A.2 E/Z: 2.406 KA AT -83.07 DEG (55.02 MVA) X/R: 8.23
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.3822 + J 3.1439 OHMS
CONTRIBUTIONS: 1A.01A 2.406 KA ANG: -263.07

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.406	0.85	R

TOTAL REMOTE: 2.406 KA NACD RATIO: 1.0000

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.001
DUTY (KA) :	2.406	2.406	2.406	2.409

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.154	1.026	1.000	1.000
DUTY (KA) :	2.778	2.470	2.406	2.406

1A.02 E/Z: 2.304 KA AT -78.87 DEG (52.68 MVA) X/R: 5.09
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6382 + J 3.2453 OHMS
CONTRIBUTIONS: 1A.01 2.304 KA ANG: -78.87

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.304	0.86	R

TOTAL REMOTE: 2.304 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.304	2.304	2.304	2.304

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.056	1.000	1.000	1.000
DUTY (KA) :	2.432	2.304	2.304	2.304

1A.02.1 E/Z: 2.304 KA AT -78.87 DEG (52.68 MVA) X/R: 5.09
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6382 + J 3.2453 OHMS
CONTRIBUTIONS: 1A.02 2.304 KA ANG: -78.87

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.304	0.86	R

TOTAL REMOTE: 2.304 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.304	2.304	2.304	2.304

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.056	1.000	1.000	1.000
DUTY (KA) :	2.432	2.304	2.304	2.304

THREE PHASE INTERRUPTING DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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1A.03 E/Z: 2.278 KA AT -77.88 DEG (52.09 MVA) X/R: 4.66
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7022 + J 3.2706 OHMS
CONTRIBUTIONS: 1A.02 2.278 KA ANG: -77.88

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.278	0.86	R

TOTAL REMOTE: 2.278 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.278	2.278	2.278	2.278

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.049	1.000	1.000	1.000
DUTY (KA) :	2.389	2.278	2.278	2.278

1A.03.1 E/Z: 2.278 KA AT -77.88 DEG (52.09 MVA) X/R: 4.66
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7022 + J 3.2707 OHMS
CONTRIBUTIONS: 1A.03 2.278 KA ANG: -77.88

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.278	0.86	R

TOTAL REMOTE: 2.278 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.278	2.278	2.278	2.278

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.049	1.000	1.000	1.000
DUTY (KA) :	2.389	2.278	2.278	2.278

1A.04 E/Z: 2.263 KA AT -77.30 DEG (51.73 MVA) X/R: 4.44
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7406 + J 3.2858 OHMS
CONTRIBUTIONS: 1A.03 2.263 KA ANG: -77.30

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.263	0.86	R

TOTAL REMOTE: 2.263 KA NACD RATIO: 1.0000

THREE PHASE INTERRUPTING DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.263	2.263	2.263	2.263

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.046	1.000	1.000	1.000
DUTY (KA) :	2.366	2.263	2.263	2.263

1A.04.1 E/Z: 2.263 KA AT -77.30 DEG (51.73 MVA) X/R: 4.44
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7406 + J 3.2859 OHMS
CONTRIBUTIONS: 1A.04 2.263 KA ANG: -77.30

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.263	0.86	R

TOTAL REMOTE: 2.263 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.263	2.263	2.263	2.263

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.046	1.000	1.000	1.000
DUTY (KA) :	2.366	2.263	2.263	2.263

1A01A.1 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

1A01A.1.1 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

1A01A.1.2 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

1A01A.1.3 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

1A01A.1.4 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

1A01A.1.4.1 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

1A01A.1.4.2 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

1A01A.2 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

1A01A1.4.2 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

T H R E E P H A S E I N T E R R U P U T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

1A01A1.4.3 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

1A02.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

1A03.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

1A04.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

1B.01 E/Z: 2.303 KA AT -78.81 DEG (52.65 MVA) X/R: 5.06
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6420 + J 3.2468 OHMS
CONTRIBUTIONS: 0B 2.303 KA ANG: -78.81

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.303	0.86	R

TOTAL REMOTE: 2.303 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.303	2.303	2.303	2.303

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.055	1.000	1.000	1.000
DUTY (KA) :	2.429	2.303	2.303	2.303

1B.01.1 E/Z: 2.303 KA AT -78.81 DEG (52.64 MVA) X/R: 5.06
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6420 + J 3.2469 OHMS
CONTRIBUTIONS: 1B.01 2.303 KA ANG: -78.81

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.303	0.86	R

TOTAL REMOTE: 2.303 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.303	2.303	2.303	2.303

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.055	1.000	1.000	1.000
DUTY (KA) :	2.429	2.303	2.303	2.303

THREE PHASE INTERRUPTING DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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1B.02 E/Z: 2.253 KA AT -76.95 DEG (51.52 MVA) X/R: 4.31
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7636 + J 3.2950 OHMS
CONTRIBUTIONS: 1B.01 2.253 KA ANG: -76.95

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.253	0.86	R

TOTAL REMOTE: 2.253 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.253	2.253	2.253	2.253

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.044	1.000	1.000	1.000
DUTY (KA) :	2.353	2.253	2.253	2.253

1B.02.1 E/Z: 2.253 KA AT -76.95 DEG (51.51 MVA) X/R: 4.31
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7636 + J 3.2950 OHMS
CONTRIBUTIONS: 1B.02 2.253 KA ANG: -76.95

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.253	0.86	R

TOTAL REMOTE: 2.253 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.253	2.253	2.253	2.253

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.044	1.000	1.000	1.000
DUTY (KA) :	2.353	2.253	2.253	2.253

1B.03 E/Z: 2.235 KA AT -76.29 DEG (51.10 MVA) X/R: 4.10
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.8084 + J 3.3127 OHMS
CONTRIBUTIONS: 1B.02 2.235 KA ANG: -76.29

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.235	0.87	R

TOTAL REMOTE: 2.235 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.235	2.235	2.235	2.235

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.042	1.000	1.000	1.000
DUTY (KA) :	2.328	2.235	2.235	2.235

1B.03.1 E/Z: 2.235 KA AT -76.29 DEG (51.10 MVA) X/R: 4.10
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.8084 + J 3.3128 OHMS
CONTRIBUTIONS: 1B.03 2.235 KA ANG: -76.29

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.235	0.87	R

TOTAL REMOTE: 2.235 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.235	2.235	2.235	2.235

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.042	1.000	1.000	1.000
DUTY (KA) :	2.328	2.235	2.235	2.235

1B01.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

1B02.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

1B03.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

2A.01 E/Z: 2.344 KA AT -80.45 DEG (53.59 MVA) X/R: 5.94
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.5396 + J 3.2062 OHMS
CONTRIBUTIONS: 0A 2.344 KA ANG: -80.45

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.344	0.86	R

TOTAL REMOTE: 2.344 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.344	2.344	2.344	2.344

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.083	1.000	1.000	1.000
DUTY (KA) :	2.538	2.344	2.344	2.344

2A.01.1 E/Z: 2.344 KA AT -80.45 DEG (53.59 MVA) X/R: 5.94
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.5396 + J 3.2063 OHMS
CONTRIBUTIONS: 2A.01 2.344 KA ANG: -80.45

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.344	0.86	R

TOTAL REMOTE: 2.344 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.344	2.344	2.344	2.344

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.083	1.000	1.000	1.000
DUTY (KA) :	2.537	2.344	2.344	2.344

2A.02 E/Z: 2.286 KA AT -78.16 DEG (52.25 MVA) X/R: 4.77
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6843 + J 3.2635 OHMS
CONTRIBUTIONS: 2A.01 2.286 KA ANG: -78.16

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.286	0.86	R

TOTAL REMOTE: 2.286 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.286	2.286	2.286	2.286

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.050	1.000	1.000	1.000
DUTY (KA) :	2.400	2.286	2.286	2.286

2A.02.1 E/Z: 2.285 KA AT -78.16 DEG (52.25 MVA) X/R: 4.77
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6843 + J 3.2636 OHMS
CONTRIBUTIONS: 2A.02 2.285 KA ANG: -78.16

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.285 0.86 R
TOTAL REMOTE: 2.285 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.285	2.285	2.285	2.285

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.050	1.000	1.000	1.000
DUTY (KA) :	2.400	2.285	2.285	2.285

2A.03 E/Z: 2.254 KA AT -76.99 DEG (51.54 MVA) X/R: 4.33
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7611 + J 3.2940 OHMS
CONTRIBUTIONS: 2A.02 2.254 KA ANG: -76.99

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.254 0.86 R
TOTAL REMOTE: 2.254 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.254	2.254	2.254	2.254

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.045	1.000	1.000	1.000
DUTY (KA) :	2.355	2.254	2.254	2.254

2A.03.1 E/Z: 2.254 KA AT -76.99 DEG (51.54 MVA) X/R: 4.33
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7611 + J 3.2940 OHMS
CONTRIBUTIONS: 2A.03 2.254 KA ANG: -76.99

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.254 0.86 R
TOTAL REMOTE: 2.254 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.254	2.254	2.254	2.254

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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		TOT2	TOT3	TOT5	TOT8
	MULT. FACT:	1.045	1.000	1.000	1.000
	DUTY (KA) :	2.355	2.254	2.254	2.254

2A01.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

2A02.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

2A03.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

2C.01 E/Z: 3.074 KA AT -76.05 DEG (70.28 MVA) X/R: 4.02
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.5978 + J 2.4059 OHMS
CONTRIBUTIONS: 0C 3.074 KA ANG: -256.05

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	3.074	0.81	R

TOTAL REMOTE: 3.074 KA NACD RATIO: 1.0000

		SYM2	SYM3	SYM5	SYM8
	MULT. FACT:	1.000	1.000	1.000	1.000
	DUTY (KA) :	3.074	3.074	3.074	3.074

		TOT2	TOT3	TOT5	TOT8
	MULT. FACT:	1.041	1.000	1.000	1.000
	DUTY (KA) :	3.199	3.074	3.074	3.074

2C.01.1 E/Z: 3.074 KA AT -76.05 DEG (70.28 MVA) X/R: 4.02
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.5979 + J 2.4060 OHMS
CONTRIBUTIONS: 2C.01 3.074 KA ANG: -76.05

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	3.074	0.81	R

TOTAL REMOTE: 3.074 KA NACD RATIO: 1.0000

		SYM2	SYM3	SYM5	SYM8
	MULT. FACT:	1.000	1.000	1.000	1.000
	DUTY (KA) :	3.074	3.074	3.074	3.074

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.041	1.000	1.000	1.000
DUTY (KA) :	3.199	3.074	3.074	3.074

2C.02 E/Z: 3.034 KA AT -75.02 DEG (69.38 MVA) X/R: 3.74
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6490 + J 2.4262 OHMS
CONTRIBUTIONS: 2C.01 3.034 KA ANG: -75.02

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	3.034	0.82	R

TOTAL REMOTE: 3.034 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	3.034	3.034	3.034	3.034

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.037	1.000	1.000	1.000
DUTY (KA) :	3.147	3.034	3.034	3.034

2C.02.1 E/Z: 3.034 KA AT -75.02 DEG (69.37 MVA) X/R: 3.74
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6491 + J 2.4263 OHMS
CONTRIBUTIONS: 2C.02 3.034 KA ANG: -75.02

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	3.034	0.82	R

TOTAL REMOTE: 3.034 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	3.034	3.034	3.034	3.034

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.037	1.000	1.000	1.000
DUTY (KA) :	3.147	3.034	3.034	3.034

2C.03 E/Z: 2.985 KA AT -73.78 DEG (68.24 MVA) X/R: 3.44
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7130 + J 2.4516 OHMS

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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CONTRIBUTIONS TO 2C.03 (CONTINUED)
CONTRIBUTIONS: 2C.02 2.985 KA ANG: -73.78

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.985 0.82 R
TOTAL REMOTE: 2.985 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.985	2.985	2.985	2.985

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.033	1.000	1.000	1.000
DUTY (KA) :	3.084	2.985	2.985	2.985

2C.03.1 E/Z: 2.985 KA AT -73.78 DEG (68.24 MVA) X/R: 3.44
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7131 + J 2.4516 OHMS
CONTRIBUTIONS: 2C.03 2.985 KA ANG: -73.78

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.985 0.82 R
TOTAL REMOTE: 2.985 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.985	2.985	2.985	2.985

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.033	1.000	1.000	1.000
DUTY (KA) :	3.084	2.985	2.985	2.985

2C.03.2 E/Z: 2.985 KA AT -73.78 DEG (68.24 MVA) X/R: 3.44
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7131 + J 2.4516 OHMS
CONTRIBUTIONS: 2C.03 2.985 KA ANG: -73.78

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.985 0.82 R
TOTAL REMOTE: 2.985 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.985	2.985	2.985	2.985

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.033	1.000	1.000	1.000
DUTY (KA) :	3.084	2.985	2.985	2.985

2C.04 E/Z: 2.892 KA AT -71.54 DEG (66.12 MVA) X/R: 2.99
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.8346 + J 2.4997 OHMS
CONTRIBUTIONS: 2C.03 2.892 KA ANG: -71.54

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.892	0.83	R

TOTAL REMOTE: 2.892 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.892	2.892	2.892	2.892

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.028	1.000	1.000	1.000
DUTY (KA) :	2.972	2.892	2.892	2.892

2C.04.1 E/Z: 2.892 KA AT -71.54 DEG (66.11 MVA) X/R: 2.99
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.8347 + J 2.4998 OHMS
CONTRIBUTIONS: 2C.04 2.892 KA ANG: -71.54

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.892	0.83	R

TOTAL REMOTE: 2.892 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.892	2.892	2.892	2.892

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.028	1.000	1.000	1.000
DUTY (KA) :	2.972	2.892	2.892	2.892

2C01.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

2C02.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

T H R E E P H A S E I N T E R R U P U T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

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2C03.1 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

2C03.2 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

2C04.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

3B.01 E/Z: 2.294 KA AT -78.48 DEG (52.44 MVA) X/R: 4.90
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6638 + J 3.2554 OHMS
CONTRIBUTIONS: 0B 2.294 KA ANG: -78.48

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.294 0.86 R
TOTAL REMOTE: 2.294 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.294	2.294	2.294	2.294

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.052	1.000	1.000	1.000
DUTY (KA) :	2.413	2.294	2.294	2.294

3B.01.1 E/Z: 2.294 KA AT -78.48 DEG (52.44 MVA) X/R: 4.90
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6638 + J 3.2555 OHMS
CONTRIBUTIONS: 3B.01 2.294 KA ANG: -78.48

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.294 0.86 R
TOTAL REMOTE: 2.294 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.294	2.294	2.294	2.294

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.052	1.000	1.000	1.000
DUTY (KA) :	2.413	2.294	2.294	2.294

3B.02 E/Z: 2.277 KA AT -77.82 DEG (52.05 MVA) X/R: 4.63
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7060 + J 3.2721 OHMS
CONTRIBUTIONS: 3B.01 2.277 KA ANG: 102.18

THREE PHASE INTERRUPTING DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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	GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
	NMPC	2.277	0.86	R

TOTAL REMOTE: 2.277 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.277	2.277	2.277	2.277

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.048	1.000	1.000	1.000
DUTY (KA) :	2.387	2.277	2.277	2.277

3B.02.1 E/Z: 2.277 KA AT -77.82 DEG (52.05 MVA) X/R: 4.63
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7060 + J 3.2722 OHMS
CONTRIBUTIONS: 3B.02 2.277 KA ANG: -77.82

	GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
	NMPC	2.277	0.86	R

TOTAL REMOTE: 2.277 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.277	2.277	2.277	2.277

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.048	1.000	1.000	1.000
DUTY (KA) :	2.387	2.277	2.277	2.277

3B.03 E/Z: 2.259 KA AT -77.18 DEG (51.66 MVA) X/R: 4.40
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7483 + J 3.2889 OHMS
CONTRIBUTIONS: 3B.02 2.259 KA ANG: -77.18

	GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
	NMPC	2.259	0.86	R

TOTAL REMOTE: 2.259 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.259	2.259	2.259	2.259

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.045	1.000	1.000	1.000
DUTY (KA) :	2.362	2.259	2.259	2.259

3B.03.1 E/Z: 2.259 KA AT -77.18 DEG (51.66 MVA) X/R: 4.40
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7483 + J 3.2889 OHMS
CONTRIBUTIONS: 3B.03 2.259 KA ANG: -77.18

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.259	0.86	R

TOTAL REMOTE: 2.259 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.259	2.259	2.259	2.259

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.045	1.000	1.000	1.000
DUTY (KA) :	2.362	2.259	2.259	2.259

3B.04 E/Z: 2.209 KA AT -75.34 DEG (50.50 MVA) X/R: 3.82
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.8731 + J 3.3383 OHMS
CONTRIBUTIONS: 3B.03 2.209 KA ANG: -75.34

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.209	0.87	R

TOTAL REMOTE: 2.209 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.209	2.209	2.209	2.209

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.038	1.000	1.000	1.000
DUTY (KA) :	2.293	2.209	2.209	2.209

3B.04.1 E/Z: 2.209 KA AT -75.34 DEG (50.49 MVA) X/R: 3.82
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.8731 + J 3.3384 OHMS
CONTRIBUTIONS: 3B.04 2.209 KA ANG: -75.34

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.209 0.87 R
TOTAL REMOTE: 2.209 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.209	2.209	2.209	2.209

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.038	1.000	1.000	1.000
DUTY (KA) :	2.293	2.209	2.209	2.209

3B01.1 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

3B02.1 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

3B03.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

3B04.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

3C.01 E/Z: 3.069 KA AT -75.92 DEG (70.17 MVA) X/R: 3.99
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6042 + J 2.4085 OHMS
CONTRIBUTIONS: 0C 3.069 KA ANG: -255.92

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 3.069 0.82 R
TOTAL REMOTE: 3.069 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	3.069	3.069	3.069	3.069

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.040	1.000	1.000	1.000
DUTY (KA) :	3.193	3.069	3.069	3.069

3C.01.1 E/Z: 3.069 KA AT -75.92 DEG (70.17 MVA) X/R: 3.99
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6043 + J 2.4085 OHMS
CONTRIBUTIONS: 3C.01 3.069 KA ANG: -75.92

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 3.069 0.82 R
TOTAL REMOTE: 3.069 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	3.069	3.069	3.069	3.069

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.040	1.000	1.000	1.000
DUTY (KA) :	3.193	3.069	3.069	3.069

3C.02 E/Z: 2.975 KA AT -73.54 DEG (68.02 MVA) X/R: 3.38
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7258 + J 2.4566 OHMS
CONTRIBUTIONS: 3C.01 2.975 KA ANG: -73.54

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.975 0.82 R
TOTAL REMOTE: 2.975 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.975	2.975	2.975	2.975

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.033	1.000	1.000	1.000
DUTY (KA) :	3.072	2.975	2.975	2.975

3C.02.1 E/Z: 2.975 KA AT -73.54 DEG (68.02 MVA) X/R: 3.38
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7259 + J 2.4567 OHMS
CONTRIBUTIONS: 3C.02 2.975 KA ANG: -73.54

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.975 0.82 R
TOTAL REMOTE: 2.975 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.975	2.975	2.975	2.975

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.033	1.000	1.000	1.000
DUTY (KA) :	3.072	2.975	2.975	2.975

3C.03 E/Z: 2.950 KA AT -72.94 DEG (67.46 MVA) X/R: 3.26
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7578 + J 2.4693 OHMS
CONTRIBUTIONS: 3C.02 2.950 KA ANG: -72.94

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.950	0.82	R

TOTAL REMOTE: 2.950 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.950	2.950	2.950	2.950

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.031	1.000	1.000	1.000
DUTY (KA) :	3.042	2.950	2.950	2.950

3C.03.1 E/Z: 2.950 KA AT -72.94 DEG (67.46 MVA) X/R: 3.26
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7579 + J 2.4694 OHMS
CONTRIBUTIONS: 3C.03 2.950 KA ANG: -72.94

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.950	0.82	R

TOTAL REMOTE: 2.950 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.950	2.950	2.950	2.950

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.031	1.000	1.000	1.000
DUTY (KA) :	3.042	2.950	2.950	2.950

3C.04 E/Z: 2.850 KA AT -70.56 DEG (65.16 MVA) X/R: 2.83
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.8898 + J 2.5216 OHMS
CONTRIBUTIONS: 3C.03 2.850 KA ANG: -70.56

THREE PHASE INTERRUPTING DUTY REPORT

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.850 0.83 R
TOTAL REMOTE: 2.850 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.850	2.850	2.850	2.850

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.026	1.000	1.000	1.000
DUTY (KA) :	2.923	2.850	2.850	2.850

3C.04.1 E/Z: 2.850 KA AT -70.56 DEG (65.16 MVA) X/R: 2.83
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.8898 + J 2.5216 OHMS
CONTRIBUTIONS: 3C.04 2.850 KA ANG: -70.56

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.850 0.83 R
TOTAL REMOTE: 2.850 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.850	2.850	2.850	2.850

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.026	1.000	1.000	1.000
DUTY (KA) :	2.923	2.850	2.850	2.850

3C01.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

3C02.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

3C03.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

3C04.1 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

4B.01 E/Z: 2.177 KA AT -74.23 DEG (49.76 MVA) X/R: 3.54
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.9518 + J 3.3695 OHMS
CONTRIBUTIONS: 0B 2.177 KA ANG: -74.23

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.177 0.87 R
TOTAL REMOTE: 2.177 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.177	2.177	2.177	2.177

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.035	1.000	1.000	1.000
DUTY (KA) :	2.252	2.177	2.177	2.177

4B.01.1 E/Z: 2.177 KA AT -74.23 DEG (49.76 MVA) X/R: 3.54
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.9518 + J 3.3696 OHMS
CONTRIBUTIONS: 4B.01 2.177 KA ANG: -74.23

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.177 0.87 R
TOTAL REMOTE: 2.177 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.177	2.177	2.177	2.177

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.035	1.000	1.000	1.000
DUTY (KA) :	2.252	2.177	2.177	2.177

4B.02 E/Z: 2.134 KA AT -72.79 DEG (48.79 MVA) X/R: 3.23
VOLTAGE: 13200. EQUIV. IMPEDANCE= 1.0567 + J 3.4111 OHMS
CONTRIBUTIONS: 4B.01 2.134 KA ANG: -72.79

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.134 0.87 R
TOTAL REMOTE: 2.134 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.134	2.134	2.134	2.134

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.031	1.000	1.000	1.000
DUTY (KA) :	2.200	2.134	2.134	2.134

4B.02.1 E/Z: 2.134 KA AT -72.79 DEG (48.79 MVA) X/R: 3.23
VOLTAGE: 13200. EQUIV. IMPEDANCE= 1.0568 + J 3.4111 OHMS
CONTRIBUTIONS: 4B.02 2.134 KA ANG: -72.79

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.134	0.87	R

TOTAL REMOTE: 2.134 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.134	2.134	2.134	2.134

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.031	1.000	1.000	1.000
DUTY (KA) :	2.200	2.134	2.134	2.134

4B.04 E/Z: 2.112 KA AT -72.04 DEG (48.28 MVA) X/R: 3.08
VOLTAGE: 13200. EQUIV. IMPEDANCE= 1.1131 + J 3.4334 OHMS
CONTRIBUTIONS: 4B.02 2.112 KA ANG: -72.04

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.112	0.87	R

TOTAL REMOTE: 2.112 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.112	2.112	2.112	2.112

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.029	1.000	1.000	1.000
DUTY (KA) :	2.172	2.112	2.112	2.112

4B.04.1 E/Z: 2.111 KA AT -72.04 DEG (48.27 MVA) X/R: 3.08
VOLTAGE: 13200. EQUIV. IMPEDANCE= 1.1131 + J 3.4334 OHMS
CONTRIBUTIONS: 4B.04 2.111 KA ANG: -72.04

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.111 0.87 R
TOTAL REMOTE: 2.111 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.111	2.111	2.111	2.111

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.029	1.000	1.000	1.000
DUTY (KA) :	2.172	2.111	2.111	2.111

4B.05 E/Z: 2.077 KA AT -70.92 DEG (47.49 MVA) X/R: 2.89
VOLTAGE: 13200. EQUIV. IMPEDANCE= 1.1995 + J 3.4676 OHMS
CONTRIBUTIONS: 4B.04 2.077 KA ANG: -70.92

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.077 0.88 R
TOTAL REMOTE: 2.077 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.077	2.077	2.077	2.077

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.026	1.000	1.000	1.000
DUTY (KA) :	2.132	2.077	2.077	2.077

4B.05.1 E/Z: 2.077 KA AT -70.92 DEG (47.49 MVA) X/R: 2.89
VOLTAGE: 13200. EQUIV. IMPEDANCE= 1.1995 + J 3.4677 OHMS
CONTRIBUTIONS: 4B.05 2.077 KA ANG: -70.92

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.077 0.88 R
TOTAL REMOTE: 2.077 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.077	2.077	2.077	2.077

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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		TOT2	TOT3	TOT5	TOT8
	MULT. FACT:	1.026	1.000	1.000	1.000
	DUTY (KA) :	2.132	2.077	2.077	2.077

4B01.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

4B02.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

4B04.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

4B05.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

4C.01.0 E/Z: 3.060 KA AT -75.68 DEG (69.97 MVA) X/R: 3.92
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6158 + J 2.4130 OHMS
CONTRIBUTIONS: 0C 3.060 KA ANG: -75.68

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	3.060	0.82	R

TOTAL REMOTE: 3.060 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	3.060	3.060	3.060	3.060

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.039	1.000	1.000	1.000
DUTY (KA) :	3.181	3.060	3.060	3.060

4C.01.1 E/Z: 3.060 KA AT -75.68 DEG (69.96 MVA) X/R: 3.92
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6158 + J 2.4131 OHMS
CONTRIBUTIONS: 4C.01.0 3.060 KA ANG: -75.68

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	3.060	0.82	R

TOTAL REMOTE: 3.060 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	3.060	3.060	3.060	3.060

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.039	1.000	1.000	1.000
DUTY (KA) :	3.181	3.060	3.060	3.060

4C.01.2 E/Z: 3.060 KA AT -75.68 DEG (69.96 MVA) X/R: 3.92
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6158 + J 2.4131 OHMS
CONTRIBUTIONS: 4C.01.0 3.060 KA ANG: -75.68

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	3.060	0.82	R

TOTAL REMOTE: 3.060 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	3.060	3.060	3.060	3.060

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.039	1.000	1.000	1.000
DUTY (KA) :	3.181	3.060	3.060	3.060

4C.02 E/Z: 2.995 KA AT -74.04 DEG (68.48 MVA) X/R: 3.50
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6997 + J 2.4463 OHMS
CONTRIBUTIONS: 4C.01.0 2.995 KA ANG: 105.96

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.995	0.82	R

TOTAL REMOTE: 2.995 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.995	2.995	2.995	2.995

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.034	1.000	1.000	1.000
DUTY (KA) :	3.097	2.995	2.995	2.995

4C.02.1 E/Z: 2.995 KA AT -74.04 DEG (68.48 MVA) X/R: 3.50
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6997 + J 2.4464 OHMS
CONTRIBUTIONS: 4C.02 2.995 KA ANG: -74.04

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.995 0.82 R
TOTAL REMOTE: 2.995 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.995	2.995	2.995	2.995

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.034	1.000	1.000	1.000
DUTY (KA) :	3.097	2.995	2.995	2.995

4C.02.2 E/Z: 2.995 KA AT -74.04 DEG (68.48 MVA) X/R: 3.50
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.6997 + J 2.4464 OHMS
CONTRIBUTIONS: 4C.02 2.995 KA ANG: -74.04

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.995 0.82 R
TOTAL REMOTE: 2.995 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.995	2.995	2.995	2.995

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.034	1.000	1.000	1.000
DUTY (KA) :	3.097	2.995	2.995	2.995

4C.03 E/Z: 2.923 KA AT -72.29 DEG (66.84 MVA) X/R: 3.13
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7932 + J 2.4833 OHMS
CONTRIBUTIONS: 4C.02 2.923 KA ANG: -72.29

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.923 0.83 R
TOTAL REMOTE: 2.923 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.923	2.923	2.923	2.923

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

==========

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.029	1.000	1.000	1.000
DUTY (KA) :	3.009	2.923	2.923	2.923

4C.03.1 E/Z: 2.923 KA AT -72.29 DEG (66.84 MVA) X/R: 3.13
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.7932 + J 2.4834 OHMS
CONTRIBUTIONS: 4C.03 2.923 KA ANG: -72.29

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.923	0.83	R

TOTAL REMOTE: 2.923 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.923	2.923	2.923	2.923

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.029	1.000	1.000	1.000
DUTY (KA) :	3.009	2.923	2.923	2.923

4C.04 E/Z: 2.914 KA AT -72.05 DEG (66.61 MVA) X/R: 3.09
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.8060 + J 2.4884 OHMS
CONTRIBUTIONS: 4C.03 2.914 KA ANG: 107.95

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	2.914	0.83	R

TOTAL REMOTE: 2.914 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.914	2.914	2.914	2.914

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.029	1.000	1.000	1.000
DUTY (KA) :	2.998	2.914	2.914	2.914

4C.04.1 E/Z: 2.914 KA AT -72.05 DEG (66.61 MVA) X/R: 3.09
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.8060 + J 2.4884 OHMS
CONTRIBUTIONS: 4C.04 2.914 KA ANG: -72.05

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

==========

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 2.914 0.83 R
TOTAL REMOTE: 2.914 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	2.914	2.914	2.914	2.914

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.029	1.000	1.000	1.000
DUTY (KA) :	2.998	2.914	2.914	2.914

4C01.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

4C01.2 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

4C02.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

4C02.2 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

4C03.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

4C04.1 VOLTAGE: 208. (SEE LOW VOLTAGE REPORT)

5C.01 E/Z: 3.277 KA AT -82.03 DEG (74.92 MVA) X/R: 7.14
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.3226 + J 2.3033 OHMS
CONTRIBUTIONS: 0C 3.277 KA ANG: -262.03

GENERATOR NAME -- AT BUS -- KA VOLTS PU LOCAL/REMOTE
NMPC 3.277 0.80 R
TOTAL REMOTE: 3.277 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	3.277	3.277	3.277	3.277

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.120	1.009	1.000	1.000
DUTY (KA) :	3.670	3.307	3.277	3.277

T H R E E P H A S E I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

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5C.01.1 E/Z: 3.272 KA AT -81.84 DEG (74.81 MVA) X/R: 6.97
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.3307 + J 2.3054 OHMS
CONTRIBUTIONS: 5C.01 3.272 KA ANG: 98.16

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	3.272	0.80	R

TOTAL REMOTE: 3.272 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	3.272	3.272	3.272	3.272

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.115	1.007	1.000	1.000
DUTY (KA) :	3.648	3.294	3.272	3.272

5C.01.2 E/Z: 3.276 KA AT -82.00 DEG (74.90 MVA) X/R: 7.12
VOLTAGE: 13200. EQUIV. IMPEDANCE= 0.3237 + J 2.3038 OHMS
CONTRIBUTIONS: 5C.01 3.276 KA ANG: -262.00

GENERATOR NAME -- AT BUS --	KA	VOLTS PU	LOCAL/REMOTE
NMPC	3.276	0.80	R

TOTAL REMOTE: 3.276 KA NACD RATIO: 1.0000

	SYM2	SYM3	SYM5	SYM8
MULT. FACT:	1.000	1.000	1.000	1.000
DUTY (KA) :	3.276	3.276	3.276	3.276

	TOT2	TOT3	TOT5	TOT8
MULT. FACT:	1.120	1.009	1.000	1.000
DUTY (KA) :	3.667	3.306	3.276	3.276

5C01.1 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

5C01.1.2 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

5C01.2 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

5C012.1 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

G01 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

G01.1 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

G01.1.2 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

T H R E E P H A S E I N T E R R U P U T I N G D U T Y R E P O R T
PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO

G01.2 VOLTAGE: 480. (SEE LOW VOLTAGE REPORT)

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
0.000	3P Duty:	6.30	7.2 SYM2:	1.00	1.00	6.30	6.20
VOLTS: 34500.0	SLG:	6.20	7.7 SYM3:	1.00	1.00	6.30	6.20
NACD: 1.000	LN/LN:	5.46	SYM5:	1.00	1.00	6.30	6.20
	LN/LN/GND:	6.20	SYM8:	1.00	1.00	6.30	6.21
	GND RETURN:	6.11	TOT2:	1.12	1.14	7.07	7.06
	Z1(PU):	0.26551	TOT3:	1.01	1.02	6.37	6.32
	Z2(PU):	0.26551	TOT5:	1.00	1.00	6.30	6.20
	Z0(PU):	0.27829	TOT8:	1.00	1.00	6.30	6.20
0.01	3P Duty:	6.30	7.1 SYM2:	1.00	1.00	6.30	6.20
VOLTS: 34500.0	SLG:	6.20	7.6 SYM3:	1.00	1.00	6.30	6.20
NACD: 1.000	LN/LN:	5.45	SYM5:	1.00	1.00	6.30	6.20
	LN/LN/GND:	6.20	SYM8:	1.00	1.00	6.30	6.20
	GND RETURN:	6.09	TOT2:	1.12	1.14	7.05	7.04
	Z1(PU):	0.26568	TOT3:	1.01	1.02	6.36	6.30
	Z2(PU):	0.26568	TOT5:	1.00	1.00	6.30	6.20
	Z0(PU):	0.27904	TOT8:	1.00	1.00	6.30	6.20
0.02	3P Duty:	6.30	7.1 SYM2:	1.00	1.00	6.30	6.20
VOLTS: 34500.0	SLG:	6.20	7.6 SYM3:	1.00	1.00	6.30	6.20
NACD: 1.000	LN/LN:	5.45	SYM5:	1.00	1.00	6.30	6.20
	LN/LN/GND:	6.20	SYM8:	1.00	1.00	6.30	6.20
	GND RETURN:	6.09	TOT2:	1.12	1.14	7.05	7.04
	Z1(PU):	0.26568	TOT3:	1.01	1.02	6.36	6.30
	Z2(PU):	0.26568	TOT5:	1.00	1.00	6.30	6.20
	Z0(PU):	0.27904	TOT8:	1.00	1.00	6.30	6.20
0.03	3P Duty:	6.30	7.1 SYM2:	1.00	1.00	6.30	6.20
VOLTS: 34500.0	SLG:	6.20	7.6 SYM3:	1.00	1.00	6.30	6.20
NACD: 1.000	LN/LN:	5.45	SYM5:	1.00	1.00	6.30	6.20
	LN/LN/GND:	6.20	SYM8:	1.00	1.00	6.30	6.20
	GND RETURN:	6.09	TOT2:	1.12	1.14	7.05	7.04
	Z1(PU):	0.26568	TOT3:	1.01	1.02	6.36	6.30
	Z2(PU):	0.26568	TOT5:	1.00	1.00	6.30	6.20
	Z0(PU):	0.27904	TOT8:	1.00	1.00	6.30	6.20

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	SLG	INTERRUPTING DUTIES (KA) 3 PHASE	SLG
0.1	3P Duty:	2.51	12.8 SYM2:	1.00	1.00	2.51	0.39
VOLTS: 13200.0	SLG:	0.39	0.1 SYM3:	1.00	1.00	2.51	0.39
NACD: 1.000	LN/LN:	2.17	SYM5:	1.00	1.00	2.51	0.39
	LN/LN/GND:	2.27	SYM8:	1.03	1.00	2.57	0.39
	GND RETURN:	0.20	TOT2:	1.28	1.00	3.21	0.39
	Z1(PU):	1.74508	TOT3:	1.11	1.00	2.79	0.39
	Z2(PU):	1.74508	TOT5:	1.04	1.00	2.61	0.39
	Z0(PU):	32.84515	TOT8:	1.00	1.00	2.51	0.39
0.1.1	3P Duty:	2.51	12.8 SYM2:	1.00	1.00	2.51	0.39
VOLTS: 13200.0	SLG:	0.39	0.1 SYM3:	1.00	1.00	2.51	0.39
NACD: 1.000	LN/LN:	2.17	SYM5:	1.00	1.00	2.51	0.39
	LN/LN/GND:	2.27	SYM8:	1.03	1.00	2.57	0.39
	GND RETURN:	0.20	TOT2:	1.28	1.00	3.21	0.39
	Z1(PU):	1.74579	TOT3:	1.11	1.00	2.78	0.39
	Z2(PU):	1.74579	TOT5:	1.04	1.00	2.61	0.39
	Z0(PU):	32.84647	TOT8:	1.00	1.00	2.51	0.39
0.1.2	3P Duty:	2.41	8.7 SYM2:	1.00	1.00	2.41	0.39
VOLTS: 13200.0	SLG:	0.39	0.2 SYM3:	1.00	1.00	2.41	0.39
NACD: 1.000	LN/LN:	2.09	SYM5:	1.00	1.00	2.41	0.39
	LN/LN/GND:	2.19	SYM8:	1.00	1.00	2.42	0.39
	GND RETURN:	0.20	TOT2:	1.17	1.00	2.82	0.39
	Z1(PU):	1.81121	TOT3:	1.03	1.00	2.50	0.39
	Z2(PU):	1.81121	TOT5:	1.00	1.00	2.42	0.39
	Z0(PU):	32.96564	TOT8:	1.00	1.00	2.41	0.39
0.2	3P Duty:	2.51	12.8 SYM2:	1.00	1.00	2.51	0.39
VOLTS: 13200.0	SLG:	0.39	0.1 SYM3:	1.00	1.00	2.51	0.39
NACD: 1.000	LN/LN:	2.17	SYM5:	1.00	1.00	2.51	0.39
	LN/LN/GND:	2.27	SYM8:	1.03	1.00	2.57	0.39
	GND RETURN:	0.20	TOT2:	1.28	1.00	3.21	0.39
	Z1(PU):	1.74508	TOT3:	1.11	1.00	2.79	0.39
	Z2(PU):	1.74508	TOT5:	1.04	1.00	2.61	0.39
	Z0(PU):	32.84515	TOT8:	1.00	1.00	2.51	0.39

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R		ANSI AC/DC DECREMENT FACT. 3 PHASE	SLG	INTERRUPTING DUTIES (KA) 3 PHASE	SLG
0.2.1	3P Duty:	2.51	12.8	SYM2:	1.00	1.00	2.51	0.39
VOLTS: 13200.0	SLG:	0.39	0.1	SYM3:	1.00	1.00	2.51	0.39
NACD: 1.000	LN/LN:	2.17		SYM5:	1.00	1.00	2.51	0.39
	LN/LN/GND:	2.27		SYM8:	1.03	1.00	2.57	0.39
	GND RETURN:	0.20		TOT2:	1.28	1.00	3.21	0.39
	Z1(PU):		1.74579	TOT3:	1.11	1.00	2.78	0.39
	Z2(PU):		1.74579	TOT5:	1.04	1.00	2.61	0.39
	Z0(PU):		32.84647	TOT8:	1.00	1.00	2.51	0.39
0.2.2	3P Duty:	2.41	8.7	SYM2:	1.00	1.00	2.41	0.39
VOLTS: 13200.0	SLG:	0.39	0.2	SYM3:	1.00	1.00	2.41	0.39
NACD: 1.000	LN/LN:	2.09		SYM5:	1.00	1.00	2.41	0.39
	LN/LN/GND:	2.19		SYM8:	1.00	1.00	2.42	0.39
	GND RETURN:	0.20		TOT2:	1.17	1.00	2.82	0.39
	Z1(PU):		1.81121	TOT3:	1.03	1.00	2.50	0.39
	Z2(PU):		1.81121	TOT5:	1.00	1.00	2.42	0.39
	Z0(PU):		32.96564	TOT8:	1.00	1.00	2.41	0.39
0.3	3P Duty:	3.47	12.1	SYM2:	1.00	1.00	3.47	0.39
VOLTS: 13200.0	SLG:	0.39	0.1	SYM3:	1.00	1.00	3.47	0.39
NACD: 1.000	LN/LN:	3.01		SYM5:	1.00	1.00	3.47	0.39
	LN/LN/GND:	3.11		SYM8:	1.02	1.00	3.54	0.39
	GND RETURN:	0.20		TOT2:	1.26	1.00	4.38	0.39
	Z1(PU):		1.25981	TOT3:	1.10	1.00	3.81	0.39
	Z2(PU):		1.25981	TOT5:	1.03	1.00	3.58	0.39
	Z0(PU):		32.88612	TOT8:	1.00	1.00	3.47	0.39
0.3.1	3P Duty:	3.47	12.0	SYM2:	1.00	1.00	3.47	0.39
VOLTS: 13200.0	SLG:	0.39	0.1	SYM3:	1.00	1.00	3.47	0.39
NACD: 1.000	LN/LN:	3.00		SYM5:	1.00	1.00	3.47	0.39
	LN/LN/GND:	3.10		SYM8:	1.02	1.00	3.54	0.39
	GND RETURN:	0.20		TOT2:	1.26	1.00	4.37	0.39
	Z1(PU):		1.26067	TOT3:	1.09	1.00	3.80	0.39
	Z2(PU):		1.26067	TOT5:	1.03	1.00	3.58	0.39
	Z0(PU):		32.88768	TOT8:	1.00	1.00	3.47	0.39

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	SLG	INTERRUPTING DUTIES (KA) 3 PHASE	SLG
0.3.2	3P Duty:	3.30	7.5 SYM2:	1.00	1.00	3.30	0.39
VOLTS: 13200.0	SLG:	0.39	0.1 SYM3:	1.00	1.00	3.30	0.39
NACD: 1.000	LN/LN:	2.86	SYM5:	1.00	1.00	3.30	0.39
	LN/LN/GND:	2.96	SYM8:	1.00	1.00	3.30	0.39
	GND RETURN:	0.20	TOT2:	1.13	1.00	3.74	0.39
	Z1(PU):	1.32535	TOT3:	1.02	1.00	3.35	0.39
	Z2(PU):	1.32535	TOT5:	1.00	1.00	3.30	0.39
	Z0(PU):	33.00209	TOT8:	1.00	1.00	3.30	0.39
0A	3P Duty:	2.41	8.7 SYM2:	1.00	1.00	2.41	0.39
VOLTS: 13200.0	SLG:	0.39	0.2 SYM3:	1.00	1.00	2.41	0.39
NACD: 1.000	LN/LN:	2.09	SYM5:	1.00	1.00	2.41	0.39
	LN/LN/GND:	2.19	SYM8:	1.00	1.00	2.42	0.39
	GND RETURN:	0.20	TOT2:	1.17	1.00	2.82	0.39
	Z1(PU):	1.81124	TOT3:	1.03	1.00	2.50	0.39
	Z2(PU):	1.81124	TOT5:	1.00	1.00	2.42	0.39
	Z0(PU):	32.96568	TOT8:	1.00	1.00	2.41	0.39
0B	3P Duty:	2.41	8.7 SYM2:	1.00	1.00	2.41	0.39
VOLTS: 13200.0	SLG:	0.39	0.2 SYM3:	1.00	1.00	2.41	0.39
NACD: 1.000	LN/LN:	2.09	SYM5:	1.00	1.00	2.41	0.39
	LN/LN/GND:	2.19	SYM8:	1.00	1.00	2.42	0.39
	GND RETURN:	0.20	TOT2:	1.17	1.00	2.82	0.39
	Z1(PU):	1.81124	TOT3:	1.03	1.00	2.50	0.39
	Z2(PU):	1.81124	TOT5:	1.00	1.00	2.42	0.39
	Z0(PU):	32.96568	TOT8:	1.00	1.00	2.41	0.39
0C	3P Duty:	3.30	7.5 SYM2:	1.00	1.00	3.30	0.39
VOLTS: 13200.0	SLG:	0.39	0.1 SYM3:	1.00	1.00	3.30	0.39
NACD: 1.000	LN/LN:	2.86	SYM5:	1.00	1.00	3.30	0.39
	LN/LN/GND:	2.96	SYM8:	1.00	1.00	3.30	0.39
	GND RETURN:	0.20	TOT2:	1.13	1.00	3.74	0.39
	Z1(PU):	1.32538	TOT3:	1.02	1.00	3.35	0.39
	Z2(PU):	1.32538	TOT5:	1.00	1.00	3.30	0.39
	Z0(PU):	33.00213	TOT8:	1.00	1.00	3.30	0.39

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
1A.01	3P Duty:	2.41	8.5 SYM2:	1.00	1.00	2.41	0.39
VOLTS: 13200.0	SLG:	0.39	0.2 SYM3:	1.00	1.00	2.41	0.39
NACD: 1.000	LN/LN:	2.09	SYM5:	1.00	1.00	2.41	0.39
	LN/LN/GND:	2.19	SYM8:	1.00	1.00	2.42	0.39
	GND RETURN:	0.20	TOT2:	1.16	1.00	2.80	0.39
	Z1(PU):	1.81386	TOT3:	1.03	1.00	2.49	0.39
	Z2(PU):	1.81386	TOT5:	1.00	1.00	2.41	0.39
	Z0(PU):	32.97411	TOT8:	1.00	1.00	2.41	0.39
1A.01A	3P Duty:	2.41	8.2 SYM2:	1.00	1.00	2.41	0.39
VOLTS: 13200.0	SLG:	0.39	0.2 SYM3:	1.00	1.00	2.41	0.39
NACD: 1.000	LN/LN:	2.08	SYM5:	1.00	1.00	2.41	0.39
	LN/LN/GND:	2.18	SYM8:	1.00	1.00	2.41	0.39
	GND RETURN:	0.20	TOT2:	1.15	1.00	2.78	0.39
	Z1(PU):	1.81762	TOT3:	1.03	1.00	2.47	0.39
	Z2(PU):	1.81762	TOT5:	1.00	1.00	2.41	0.39
	Z0(PU):	32.98613	TOT8:	1.00	1.00	2.41	0.39
1A.01A.1	3P Duty:	2.41	8.2 SYM2:	1.00	1.00	2.41	0.39
VOLTS: 13200.0	SLG:	0.39	0.2 SYM3:	1.00	1.00	2.41	0.39
NACD: 1.000	LN/LN:	2.08	SYM5:	1.00	1.00	2.41	0.39
	LN/LN/GND:	2.18	SYM8:	1.00	1.00	2.41	0.39
	GND RETURN:	0.20	TOT2:	1.15	1.00	2.78	0.39
	Z1(PU):	1.81766	TOT3:	1.03	1.00	2.47	0.39
	Z2(PU):	1.81766	TOT5:	1.00	1.00	2.41	0.39
	Z0(PU):	32.98618	TOT8:	1.00	1.00	2.41	0.39
1A.01A.2	3P Duty:	2.41	8.2 SYM2:	1.00	1.00	2.41	0.39
VOLTS: 13200.0	SLG:	0.39	0.2 SYM3:	1.00	1.00	2.41	0.39
NACD: 1.000	LN/LN:	2.08	SYM5:	1.00	1.00	2.41	0.39
	LN/LN/GND:	2.18	SYM8:	1.00	1.00	2.41	0.39
	GND RETURN:	0.20	TOT2:	1.15	1.00	2.78	0.39
	Z1(PU):	1.81766	TOT3:	1.03	1.00	2.47	0.39
	Z2(PU):	1.81766	TOT5:	1.00	1.00	2.41	0.39
	Z0(PU):	32.98618	TOT8:	1.00	1.00	2.41	0.39

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
1A.02	3P Duty:	2.30	5.1 SYM2:	1.00	1.00	2.30	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.30	0.38
NACD: 1.000	LN/LN:	2.00	SYM5:	1.00	1.00	2.30	0.38
	LN/LN/GND:	2.09	SYM8:	1.00	1.00	2.30	0.38
	GND RETURN:	0.20	TOT2:	1.06	1.00	2.43	0.38
	Z1(PU):	1.89821	TOT3:	1.00	1.00	2.30	0.38
	Z2(PU):	1.89821	TOT5:	1.00	1.00	2.30	0.38
	Z0(PU):	33.22695	TOT8:	1.00	1.00	2.30	0.38
1A.02.1	3P Duty:	2.30	5.1 SYM2:	1.00	1.00	2.30	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.30	0.38
NACD: 1.000	LN/LN:	2.00	SYM5:	1.00	1.00	2.30	0.38
	LN/LN/GND:	2.09	SYM8:	1.00	1.00	2.30	0.38
	GND RETURN:	0.20	TOT2:	1.06	1.00	2.43	0.38
	Z1(PU):	1.89824	TOT3:	1.00	1.00	2.30	0.38
	Z2(PU):	1.89824	TOT5:	1.00	1.00	2.30	0.38
	Z0(PU):	33.22700	TOT8:	1.00	1.00	2.30	0.38
1A.03	3P Duty:	2.28	4.7 SYM2:	1.00	1.00	2.28	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.28	0.38
NACD: 1.000	LN/LN:	1.97	SYM5:	1.00	1.00	2.28	0.38
	LN/LN/GND:	2.07	SYM8:	1.00	1.00	2.28	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.39	0.38
	Z1(PU):	1.91986	TOT3:	1.00	1.00	2.28	0.38
	Z2(PU):	1.91986	TOT5:	1.00	1.00	2.28	0.38
	Z0(PU):	33.28724	TOT8:	1.00	1.00	2.28	0.38
1A.03.1	3P Duty:	2.28	4.7 SYM2:	1.00	1.00	2.28	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.28	0.38
NACD: 1.000	LN/LN:	1.97	SYM5:	1.00	1.00	2.28	0.38
	LN/LN/GND:	2.07	SYM8:	1.00	1.00	2.28	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.39	0.38
	Z1(PU):	1.91989	TOT3:	1.00	1.00	2.28	0.38
	Z2(PU):	1.91989	TOT5:	1.00	1.00	2.28	0.38
	Z0(PU):	33.28729	TOT8:	1.00	1.00	2.28	0.38

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
1A.04	3P Duty:	2.26	4.4 SYM2:	1.00	1.00	2.26	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.26	0.38
NACD: 1.000	LN/LN:	1.96	SYM5:	1.00	1.00	2.26	0.38
	LN/LN/GND:	2.05	SYM8:	1.00	1.00	2.26	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.37	0.38
	Z1(PU):	1.93312	TOT3:	1.00	1.00	2.26	0.38
	Z2(PU):	1.93312	TOT5:	1.00	1.00	2.26	0.38
	Z0(PU):	33.32344	TOT8:	1.00	1.00	2.26	0.38
1A.04.1	3P Duty:	2.26	4.4 SYM2:	1.00	1.00	2.26	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.26	0.38
NACD: 1.000	LN/LN:	1.96	SYM5:	1.00	1.00	2.26	0.38
	LN/LN/GND:	2.05	SYM8:	1.00	1.00	2.26	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.37	0.38
	Z1(PU):	1.93315	TOT3:	1.00	1.00	2.26	0.38
	Z2(PU):	1.93315	TOT5:	1.00	1.00	2.26	0.38
	Z0(PU):	33.32349	TOT8:	1.00	1.00	2.26	0.38
1B.01	3P Duty:	2.30	5.1 SYM2:	1.00	1.00	2.30	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.30	0.38
NACD: 1.000	LN/LN:	1.99	SYM5:	1.00	1.00	2.30	0.38
	LN/LN/GND:	2.09	SYM8:	1.00	1.00	2.30	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.43	0.38
	Z1(PU):	1.89949	TOT3:	1.00	1.00	2.30	0.38
	Z2(PU):	1.89949	TOT5:	1.00	1.00	2.30	0.38
	Z0(PU):	33.23056	TOT8:	1.00	1.00	2.30	0.38
1B.01.1	3P Duty:	2.30	5.1 SYM2:	1.00	1.00	2.30	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.30	0.38
NACD: 1.000	LN/LN:	1.99	SYM5:	1.00	1.00	2.30	0.38
	LN/LN/GND:	2.09	SYM8:	1.00	1.00	2.30	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.43	0.38
	Z1(PU):	1.89953	TOT3:	1.00	1.00	2.30	0.38
	Z2(PU):	1.89953	TOT5:	1.00	1.00	2.30	0.38
	Z0(PU):	33.23062	TOT8:	1.00	1.00	2.30	0.38

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	SLG	INTERRUPTING DUTIES (KA) 3 PHASE	SLG
1B.02	3P Duty:	2.25	4.3 SYM2:	1.00	1.00	2.25	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.25	0.38
NACD: 1.000	LN/LN:	1.95	SYM5:	1.00	1.00	2.25	0.38
	LN/LN/GND:	2.04	SYM8:	1.00	1.00	2.25	0.38
	GND RETURN:	0.20	TOT2:	1.04	1.00	2.35	0.38
	Z1(PU):	1.94117	TOT3:	1.00	1.00	2.25	0.38
	Z2(PU):	1.94117	TOT5:	1.00	1.00	2.25	0.38
	Z0(PU):	33.34516	TOT8:	1.00	1.00	2.25	0.38
1B.02.1	3P Duty:	2.25	4.3 SYM2:	1.00	1.00	2.25	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.25	0.38
NACD: 1.000	LN/LN:	1.95	SYM5:	1.00	1.00	2.25	0.38
	LN/LN/GND:	2.04	SYM8:	1.00	1.00	2.25	0.38
	GND RETURN:	0.20	TOT2:	1.04	1.00	2.35	0.38
	Z1(PU):	1.94121	TOT3:	1.00	1.00	2.25	0.38
	Z2(PU):	1.94121	TOT5:	1.00	1.00	2.25	0.38
	Z0(PU):	33.34520	TOT8:	1.00	1.00	2.25	0.38
1B.03	3P Duty:	2.23	4.1 SYM2:	1.00	1.00	2.23	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.23	0.38
NACD: 1.000	LN/LN:	1.94	SYM5:	1.00	1.00	2.23	0.38
	LN/LN/GND:	2.03	SYM8:	1.00	1.00	2.23	0.38
	GND RETURN:	0.19	TOT2:	1.04	1.00	2.33	0.38
	Z1(PU):	1.95703	TOT3:	1.00	1.00	2.23	0.38
	Z2(PU):	1.95703	TOT5:	1.00	1.00	2.23	0.38
	Z0(PU):	33.38741	TOT8:	1.00	1.00	2.23	0.38
1B.03.1	3P Duty:	2.23	4.1 SYM2:	1.00	1.00	2.23	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.23	0.38
NACD: 1.000	LN/LN:	1.94	SYM5:	1.00	1.00	2.23	0.38
	LN/LN/GND:	2.03	SYM8:	1.00	1.00	2.23	0.38
	GND RETURN:	0.19	TOT2:	1.04	1.00	2.33	0.38
	Z1(PU):	1.95707	TOT3:	1.00	1.00	2.23	0.38
	Z2(PU):	1.95707	TOT5:	1.00	1.00	2.23	0.38
	Z0(PU):	33.38745	TOT8:	1.00	1.00	2.23	0.38

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
2A.01	3P Duty:	2.34	5.9 SYM2:	1.00	1.00	2.34	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.34	0.38
NACD: 1.000	LN/LN:	2.03	SYM5:	1.00	1.00	2.34	0.38
	LN/LN/GND:	2.13	SYM8:	1.00	1.00	2.34	0.38
	GND RETURN:	0.20	TOT2:	1.08	1.00	2.54	0.38
	Z1(PU):	1.86601	TOT3:	1.00	1.00	2.34	0.38
	Z2(PU):	1.86601	TOT5:	1.00	1.00	2.34	0.38
	Z0(PU):	33.13417	TOT8:	1.00	1.00	2.34	0.38
2A.01.1	3P Duty:	2.34	5.9 SYM2:	1.00	1.00	2.34	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.34	0.38
NACD: 1.000	LN/LN:	2.03	SYM5:	1.00	1.00	2.34	0.38
	LN/LN/GND:	2.13	SYM8:	1.00	1.00	2.34	0.38
	GND RETURN:	0.20	TOT2:	1.08	1.00	2.54	0.38
	Z1(PU):	1.86605	TOT3:	1.00	1.00	2.34	0.38
	Z2(PU):	1.86605	TOT5:	1.00	1.00	2.34	0.38
	Z0(PU):	33.13422	TOT8:	1.00	1.00	2.34	0.38
2A.02	3P Duty:	2.29	4.8 SYM2:	1.00	1.00	2.29	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.29	0.38
NACD: 1.000	LN/LN:	1.98	SYM5:	1.00	1.00	2.29	0.38
	LN/LN/GND:	2.07	SYM8:	1.00	1.00	2.29	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.40	0.38
	Z1(PU):	1.91374	TOT3:	1.00	1.00	2.29	0.38
	Z2(PU):	1.91374	TOT5:	1.00	1.00	2.29	0.38
	Z0(PU):	33.27036	TOT8:	1.00	1.00	2.29	0.38
2A.02.1	3P Duty:	2.29	4.8 SYM2:	1.00	1.00	2.29	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.29	0.38
NACD: 1.000	LN/LN:	1.98	SYM5:	1.00	1.00	2.29	0.38
	LN/LN/GND:	2.07	SYM8:	1.00	1.00	2.29	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.40	0.38
	Z1(PU):	1.91377	TOT3:	1.00	1.00	2.29	0.38
	Z2(PU):	1.91377	TOT5:	1.00	1.00	2.29	0.38
	Z0(PU):	33.27041	TOT8:	1.00	1.00	2.29	0.38

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R		ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
2A.03	3P Duty:	2.25	4.3	SYM2:	1.00	1.00	2.25	0.38
VOLTS: 13200.0	SLG:	0.38	0.2	SYM3:	1.00	1.00	2.25	0.38
NACD: 1.000	LN/LN:	1.95		SYM5:	1.00	1.00	2.25	0.38
	LN/LN/GND:	2.05		SYM8:	1.00	1.00	2.25	0.38
	GND RETURN:	0.20		TOT2:	1.04	1.00	2.35	0.38
	Z1(PU):		1.94027	TOT3:	1.00	1.00	2.25	0.38
	Z2(PU):		1.94027	TOT5:	1.00	1.00	2.25	0.38
	Z0(PU):		33.34274	TOT8:	1.00	1.00	2.25	0.38
2A.03.1	3P Duty:	2.25	4.3	SYM2:	1.00	1.00	2.25	0.38
VOLTS: 13200.0	SLG:	0.38	0.2	SYM3:	1.00	1.00	2.25	0.38
NACD: 1.000	LN/LN:	1.95		SYM5:	1.00	1.00	2.25	0.38
	LN/LN/GND:	2.05		SYM8:	1.00	1.00	2.25	0.38
	GND RETURN:	0.20		TOT2:	1.04	1.00	2.35	0.38
	Z1(PU):		1.94031	TOT3:	1.00	1.00	2.25	0.38
	Z2(PU):		1.94031	TOT5:	1.00	1.00	2.25	0.38
	Z0(PU):		33.34279	TOT8:	1.00	1.00	2.25	0.38
2C.01	3P Duty:	3.07	4.0	SYM2:	1.00	1.00	3.07	0.38
VOLTS: 13200.0	SLG:	0.38	0.1	SYM3:	1.00	1.00	3.07	0.38
NACD: 1.000	LN/LN:	2.66		SYM5:	1.00	1.00	3.07	0.38
	LN/LN/GND:	2.76		SYM8:	1.00	1.00	3.07	0.38
	GND RETURN:	0.20		TOT2:	1.04	1.00	3.20	0.38
	Z1(PU):		1.42281	TOT3:	1.00	1.00	3.07	0.38
	Z2(PU):		1.42281	TOT5:	1.00	1.00	3.07	0.38
	Z0(PU):		33.27674	TOT8:	1.00	1.00	3.07	0.38
2C.01.1	3P Duty:	3.07	4.0	SYM2:	1.00	1.00	3.07	0.38
VOLTS: 13200.0	SLG:	0.38	0.1	SYM3:	1.00	1.00	3.07	0.38
NACD: 1.000	LN/LN:	2.66		SYM5:	1.00	1.00	3.07	0.38
	LN/LN/GND:	2.76		SYM8:	1.00	1.00	3.07	0.38
	GND RETURN:	0.20		TOT2:	1.04	1.00	3.20	0.38
	Z1(PU):		1.42285	TOT3:	1.00	1.00	3.07	0.38
	Z2(PU):		1.42285	TOT5:	1.00	1.00	3.07	0.38
	Z0(PU):		33.27678	TOT8:	1.00	1.00	3.07	0.38

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
2C.02	3P Duty:	3.03	3.7 SYM2:	1.00	1.00	3.03	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	3.03	0.38
NACD: 1.000	LN/LN:	2.63	SYM5:	1.00	1.00	3.03	0.38
	LN/LN/GND:	2.72	SYM8:	1.00	1.00	3.03	0.38
	GND RETURN:	0.20	TOT2:	1.04	1.00	3.15	0.38
	Z1(PU):	1.44142	TOT3:	1.00	1.00	3.03	0.38
	Z2(PU):	1.44142	TOT5:	1.00	1.00	3.03	0.38
	Z0(PU):	33.32457	TOT8:	1.00	1.00	3.03	0.38
2C.02.1	3P Duty:	3.03	3.7 SYM2:	1.00	1.00	3.03	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	3.03	0.38
NACD: 1.000	LN/LN:	2.63	SYM5:	1.00	1.00	3.03	0.38
	LN/LN/GND:	2.72	SYM8:	1.00	1.00	3.03	0.38
	GND RETURN:	0.20	TOT2:	1.04	1.00	3.15	0.38
	Z1(PU):	1.44146	TOT3:	1.00	1.00	3.03	0.38
	Z2(PU):	1.44146	TOT5:	1.00	1.00	3.03	0.38
	Z0(PU):	33.32462	TOT8:	1.00	1.00	3.03	0.38
2C.03	3P Duty:	2.98	3.4 SYM2:	1.00	1.00	2.98	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.98	0.38
NACD: 1.000	LN/LN:	2.59	SYM5:	1.00	1.00	2.98	0.38
	LN/LN/GND:	2.68	SYM8:	1.00	1.00	2.98	0.38
	GND RETURN:	0.20	TOT2:	1.03	1.00	3.08	0.38
	Z1(PU):	1.46531	TOT3:	1.00	1.00	2.98	0.38
	Z2(PU):	1.46531	TOT5:	1.00	1.00	2.98	0.38
	Z0(PU):	33.38440	TOT8:	1.00	1.00	2.98	0.38
2C.03.1	3P Duty:	2.98	3.4 SYM2:	1.00	1.00	2.98	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.98	0.38
NACD: 1.000	LN/LN:	2.58	SYM5:	1.00	1.00	2.98	0.38
	LN/LN/GND:	2.68	SYM8:	1.00	1.00	2.98	0.38
	GND RETURN:	0.20	TOT2:	1.03	1.00	3.08	0.38
	Z1(PU):	1.46535	TOT3:	1.00	1.00	2.98	0.38
	Z2(PU):	1.46535	TOT5:	1.00	1.00	2.98	0.38
	Z0(PU):	33.38445	TOT8:	1.00	1.00	2.98	0.38

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
2C.03.2	3P Duty:	2.98	3.4 SYM2:	1.00	1.00	2.98	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.98	0.38
NACD: 1.000	LN/LN:	2.58	SYM5:	1.00	1.00	2.98	0.38
	LN/LN/GND:	2.68	SYM8:	1.00	1.00	2.98	0.38
	GND RETURN:	0.20	TOT2:	1.03	1.00	3.08	0.38
	Z1(PU):	1.46535	TOT3:	1.00	1.00	2.98	0.38
	Z2(PU):	1.46535	TOT5:	1.00	1.00	2.98	0.38
	Z0(PU):	33.38445	TOT8:	1.00	1.00	2.98	0.38
2C.04	3P Duty:	2.89	3.0 SYM2:	1.00	1.00	2.89	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.89	0.38
NACD: 1.000	LN/LN:	2.50	SYM5:	1.00	1.00	2.89	0.38
	LN/LN/GND:	2.59	SYM8:	1.00	1.00	2.89	0.38
	GND RETURN:	0.19	TOT2:	1.03	1.00	2.97	0.38
	Z1(PU):	1.51251	TOT3:	1.00	1.00	2.89	0.38
	Z2(PU):	1.51251	TOT5:	1.00	1.00	2.89	0.38
	Z0(PU):	33.49817	TOT8:	1.00	1.00	2.89	0.38
2C.04.1	3P Duty:	2.89	3.0 SYM2:	1.00	1.00	2.89	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.89	0.38
NACD: 1.000	LN/LN:	2.50	SYM5:	1.00	1.00	2.89	0.38
	LN/LN/GND:	2.59	SYM8:	1.00	1.00	2.89	0.38
	GND RETURN:	0.19	TOT2:	1.03	1.00	2.97	0.38
	Z1(PU):	1.51254	TOT3:	1.00	1.00	2.89	0.38
	Z2(PU):	1.51254	TOT5:	1.00	1.00	2.89	0.38
	Z0(PU):	33.49821	TOT8:	1.00	1.00	2.89	0.38
3B.01	3P Duty:	2.29	4.9 SYM2:	1.00	1.00	2.29	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.29	0.38
NACD: 1.000	LN/LN:	1.99	SYM5:	1.00	1.00	2.29	0.38
	LN/LN/GND:	2.08	SYM8:	1.00	1.00	2.29	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.41	0.38
	Z1(PU):	1.90680	TOT3:	1.00	1.00	2.29	0.38
	Z2(PU):	1.90680	TOT5:	1.00	1.00	2.29	0.38
	Z0(PU):	33.25106	TOT8:	1.00	1.00	2.29	0.38

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
3B.01.1	3P Duty:	2.29	4.9 SYM2:	1.00	1.00	2.29	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.29	0.38
NACD: 1.000	LN/LN:	1.99	SYM5:	1.00	1.00	2.29	0.38
	LN/LN/GND:	2.08	SYM8:	1.00	1.00	2.29	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.41	0.38
	Z1(PU):	1.90683	TOT3:	1.00	1.00	2.29	0.38
	Z2(PU):	1.90683	TOT5:	1.00	1.00	2.29	0.38
	Z0(PU):	33.25112	TOT8:	1.00	1.00	2.29	0.38
3B.02	3P Duty:	2.28	4.6 SYM2:	1.00	1.00	2.28	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.28	0.38
NACD: 1.000	LN/LN:	1.97	SYM5:	1.00	1.00	2.28	0.38
	LN/LN/GND:	2.07	SYM8:	1.00	1.00	2.28	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.39	0.38
	Z1(PU):	1.92117	TOT3:	1.00	1.00	2.28	0.38
	Z2(PU):	1.92117	TOT5:	1.00	1.00	2.28	0.38
	Z0(PU):	33.29086	TOT8:	1.00	1.00	2.28	0.38
3B.02.1	3P Duty:	2.28	4.6 SYM2:	1.00	1.00	2.28	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.28	0.38
NACD: 1.000	LN/LN:	1.97	SYM5:	1.00	1.00	2.28	0.38
	LN/LN/GND:	2.07	SYM8:	1.00	1.00	2.28	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.39	0.38
	Z1(PU):	1.92121	TOT3:	1.00	1.00	2.28	0.38
	Z2(PU):	1.92121	TOT5:	1.00	1.00	2.28	0.38
	Z0(PU):	33.29091	TOT8:	1.00	1.00	2.28	0.38
3B.03	3P Duty:	2.26	4.4 SYM2:	1.00	1.00	2.26	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.26	0.38
NACD: 1.000	LN/LN:	1.96	SYM5:	1.00	1.00	2.26	0.38
	LN/LN/GND:	2.05	SYM8:	1.00	1.00	2.26	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.36	0.38
	Z1(PU):	1.93579	TOT3:	1.00	1.00	2.26	0.38
	Z2(PU):	1.93579	TOT5:	1.00	1.00	2.26	0.38
	Z0(PU):	33.33067	TOT8:	1.00	1.00	2.26	0.38

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
3B.03.1	3P Duty:	2.26	4.4 SYM2:	1.00	1.00	2.26	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.26	0.38
NACD: 1.000	LN/LN:	1.96	SYM5:	1.00	1.00	2.26	0.38
	LN/LN/GND:	2.05	SYM8:	1.00	1.00	2.26	0.38
	GND RETURN:	0.20	TOT2:	1.05	1.00	2.36	0.38
	Z1(PU):	1.93583	TOT3:	1.00	1.00	2.26	0.38
	Z2(PU):	1.93583	TOT5:	1.00	1.00	2.26	0.38
	Z0(PU):	33.33072	TOT8:	1.00	1.00	2.26	0.38
3B.04	3P Duty:	2.21	3.8 SYM2:	1.00	1.00	2.21	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.21	0.38
NACD: 1.000	LN/LN:	1.91	SYM5:	1.00	1.00	2.21	0.38
	LN/LN/GND:	2.00	SYM8:	1.00	1.00	2.21	0.38
	GND RETURN:	0.19	TOT2:	1.04	1.00	2.29	0.38
	Z1(PU):	1.98037	TOT3:	1.00	1.00	2.21	0.38
	Z2(PU):	1.98037	TOT5:	1.00	1.00	2.21	0.38
	Z0(PU):	33.44839	TOT8:	1.00	1.00	2.21	0.38
3B.04.1	3P Duty:	2.21	3.8 SYM2:	1.00	1.00	2.21	0.38
VOLTS: 13200.0	SLG:	0.38	0.2 SYM3:	1.00	1.00	2.21	0.38
NACD: 1.000	LN/LN:	1.91	SYM5:	1.00	1.00	2.21	0.38
	LN/LN/GND:	2.00	SYM8:	1.00	1.00	2.21	0.38
	GND RETURN:	0.19	TOT2:	1.04	1.00	2.29	0.38
	Z1(PU):	1.98040	TOT3:	1.00	1.00	2.21	0.38
	Z2(PU):	1.98040	TOT5:	1.00	1.00	2.21	0.38
	Z0(PU):	33.44844	TOT8:	1.00	1.00	2.21	0.38
3C.01	3P Duty:	3.07	4.0 SYM2:	1.00	1.00	3.07	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	3.07	0.38
NACD: 1.000	LN/LN:	2.66	SYM5:	1.00	1.00	3.07	0.38
	LN/LN/GND:	2.75	SYM8:	1.00	1.00	3.07	0.38
	GND RETURN:	0.20	TOT2:	1.04	1.00	3.19	0.38
	Z1(PU):	1.42511	TOT3:	1.00	1.00	3.07	0.38
	Z2(PU):	1.42511	TOT5:	1.00	1.00	3.07	0.38
	Z0(PU):	33.28271	TOT8:	1.00	1.00	3.07	0.38

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
3C.01.1	3P Duty:	3.07	4.0 SYM2:	1.00	1.00	3.07	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	3.07	0.38
NACD: 1.000	LN/LN:	2.66	SYM5:	1.00	1.00	3.07	0.38
	LN/LN/GND:	2.75	SYM8:	1.00	1.00	3.07	0.38
	GND RETURN:	0.20	TOT2:	1.04	1.00	3.19	0.38
	Z1(PU):	1.42515	TOT3:	1.00	1.00	3.07	0.38
	Z2(PU):	1.42515	TOT5:	1.00	1.00	3.07	0.38
	Z0(PU):	33.28276	TOT8:	1.00	1.00	3.07	0.38
3C.02	3P Duty:	2.98	3.4 SYM2:	1.00	1.00	2.98	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.98	0.38
NACD: 1.000	LN/LN:	2.58	SYM5:	1.00	1.00	2.98	0.38
	LN/LN/GND:	2.67	SYM8:	1.00	1.00	2.98	0.38
	GND RETURN:	0.20	TOT2:	1.03	1.00	3.07	0.38
	Z1(PU):	1.47017	TOT3:	1.00	1.00	2.98	0.38
	Z2(PU):	1.47017	TOT5:	1.00	1.00	2.98	0.38
	Z0(PU):	33.39637	TOT8:	1.00	1.00	2.98	0.38
3C.02.1	3P Duty:	2.98	3.4 SYM2:	1.00	1.00	2.98	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.98	0.38
NACD: 1.000	LN/LN:	2.58	SYM5:	1.00	1.00	2.98	0.38
	LN/LN/GND:	2.67	SYM8:	1.00	1.00	2.98	0.38
	GND RETURN:	0.20	TOT2:	1.03	1.00	3.07	0.38
	Z1(PU):	1.47021	TOT3:	1.00	1.00	2.98	0.38
	Z2(PU):	1.47021	TOT5:	1.00	1.00	2.98	0.38
	Z0(PU):	33.39642	TOT8:	1.00	1.00	2.98	0.38
3C.03	3P Duty:	2.95	3.3 SYM2:	1.00	1.00	2.95	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.95	0.38
NACD: 1.000	LN/LN:	2.56	SYM5:	1.00	1.00	2.95	0.38
	LN/LN/GND:	2.65	SYM8:	1.00	1.00	2.95	0.38
	GND RETURN:	0.19	TOT2:	1.03	1.00	3.04	0.38
	Z1(PU):	1.48243	TOT3:	1.00	1.00	2.95	0.38
	Z2(PU):	1.48243	TOT5:	1.00	1.00	2.95	0.38
	Z0(PU):	33.42630	TOT8:	1.00	1.00	2.95	0.38

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
3C.03.1	3P Duty:	2.95	3.3 SYM2:	1.00	1.00	2.95	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.95	0.38
NACD: 1.000	LN/LN:	2.56	SYM5:	1.00	1.00	2.95	0.38
	LN/LN/GND:	2.65	SYM8:	1.00	1.00	2.95	0.38
	GND RETURN:	0.19	TOT2:	1.03	1.00	3.04	0.38
	Z1(PU):	1.48247	TOT3:	1.00	1.00	2.95	0.38
	Z2(PU):	1.48247	TOT5:	1.00	1.00	2.95	0.38
	Z0(PU):	33.42635	TOT8:	1.00	1.00	2.95	0.38
3C.04	3P Duty:	2.85	2.8 SYM2:	1.00	1.00	2.85	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.85	0.38
NACD: 1.000	LN/LN:	2.47	SYM5:	1.00	1.00	2.85	0.38
	LN/LN/GND:	2.56	SYM8:	1.00	1.00	2.85	0.38
	GND RETURN:	0.19	TOT2:	1.03	1.00	2.92	0.38
	Z1(PU):	1.53465	TOT3:	1.00	1.00	2.85	0.38
	Z2(PU):	1.53465	TOT5:	1.00	1.00	2.85	0.38
	Z0(PU):	33.54983	TOT8:	1.00	1.00	2.85	0.38
3C.04.1	3P Duty:	2.85	2.8 SYM2:	1.00	1.00	2.85	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.85	0.38
NACD: 1.000	LN/LN:	2.47	SYM5:	1.00	1.00	2.85	0.38
	LN/LN/GND:	2.56	SYM8:	1.00	1.00	2.85	0.38
	GND RETURN:	0.19	TOT2:	1.03	1.00	2.92	0.38
	Z1(PU):	1.53469	TOT3:	1.00	1.00	2.85	0.38
	Z2(PU):	1.53469	TOT5:	1.00	1.00	2.85	0.38
	Z0(PU):	33.54988	TOT8:	1.00	1.00	2.85	0.38
4B.01	3P Duty:	2.18	3.5 SYM2:	1.00	1.00	2.18	0.37
VOLTS: 13200.0	SLG:	0.37	0.2 SYM3:	1.00	1.00	2.18	0.37
NACD: 1.000	LN/LN:	1.88	SYM5:	1.00	1.00	2.18	0.37
	LN/LN/GND:	1.98	SYM8:	1.00	1.00	2.18	0.37
	GND RETURN:	0.19	TOT2:	1.03	1.00	2.25	0.37
	Z1(PU):	2.00949	TOT3:	1.00	1.00	2.18	0.37
	Z2(PU):	2.00949	TOT5:	1.00	1.00	2.18	0.37
	Z0(PU):	33.52271	TOT8:	1.00	1.00	2.18	0.37

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
4B.01.1	3P Duty:	2.18	3.5 SYM2:	1.00	1.00	2.18	0.37
VOLTS: 13200.0	SLG:	0.37	0.2 SYM3:	1.00	1.00	2.18	0.37
NACD: 1.000	LN/LN:	1.88	SYM5:	1.00	1.00	2.18	0.37
	LN/LN/GND:	1.98	SYM8:	1.00	1.00	2.18	0.37
	GND RETURN:	0.19	TOT2:	1.03	1.00	2.25	0.37
	Z1(PU):	2.00953	TOT3:	1.00	1.00	2.18	0.37
	Z2(PU):	2.00953	TOT5:	1.00	1.00	2.18	0.37
	Z0(PU):	33.52275	TOT8:	1.00	1.00	2.18	0.37
4B.02	3P Duty:	2.13	3.2 SYM2:	1.00	1.00	2.13	0.37
VOLTS: 13200.0	SLG:	0.37	0.2 SYM3:	1.00	1.00	2.13	0.37
NACD: 1.000	LN/LN:	1.85	SYM5:	1.00	1.00	2.13	0.37
	LN/LN/GND:	1.94	SYM8:	1.00	1.00	2.13	0.37
	GND RETURN:	0.19	TOT2:	1.03	1.00	2.20	0.37
	Z1(PU):	2.04948	TOT3:	1.00	1.00	2.13	0.37
	Z2(PU):	2.04948	TOT5:	1.00	1.00	2.13	0.37
	Z0(PU):	33.62187	TOT8:	1.00	1.00	2.13	0.37
4B.02.1	3P Duty:	2.13	3.2 SYM2:	1.00	1.00	2.13	0.37
VOLTS: 13200.0	SLG:	0.37	0.2 SYM3:	1.00	1.00	2.13	0.37
NACD: 1.000	LN/LN:	1.85	SYM5:	1.00	1.00	2.13	0.37
	LN/LN/GND:	1.94	SYM8:	1.00	1.00	2.13	0.37
	GND RETURN:	0.19	TOT2:	1.03	1.00	2.20	0.37
	Z1(PU):	2.04951	TOT3:	1.00	1.00	2.13	0.37
	Z2(PU):	2.04951	TOT5:	1.00	1.00	2.13	0.37
	Z0(PU):	33.62192	TOT8:	1.00	1.00	2.13	0.37
4B.04	3P Duty:	2.11	3.1 SYM2:	1.00	1.00	2.11	0.37
VOLTS: 13200.0	SLG:	0.37	0.2 SYM3:	1.00	1.00	2.11	0.37
NACD: 1.000	LN/LN:	1.83	SYM5:	1.00	1.00	2.11	0.37
	LN/LN/GND:	1.92	SYM8:	1.00	1.00	2.11	0.37
	GND RETURN:	0.19	TOT2:	1.03	1.00	2.17	0.37
	Z1(PU):	2.07145	TOT3:	1.00	1.00	2.11	0.37
	Z2(PU):	2.07145	TOT5:	1.00	1.00	2.11	0.37
	Z0(PU):	33.67513	TOT8:	1.00	1.00	2.11	0.37

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
4B.04.1	3P Duty:	2.11	3.1 SYM2:	1.00	1.00	2.11	0.37
VOLTS: 13200.0	SLG:	0.37	0.2 SYM3:	1.00	1.00	2.11	0.37
NACD: 1.000	LN/LN:	1.83	SYM5:	1.00	1.00	2.11	0.37
	LN/LN/GND:	1.92	SYM8:	1.00	1.00	2.11	0.37
	GND RETURN:	0.19	TOT2:	1.03	1.00	2.17	0.37
	Z1(PU):	2.07149	TOT3:	1.00	1.00	2.11	0.37
	Z2(PU):	2.07149	TOT5:	1.00	1.00	2.11	0.37
	Z0(PU):	33.67517	TOT8:	1.00	1.00	2.11	0.37
4B.05	3P Duty:	2.08	2.9 SYM2:	1.00	1.00	2.08	0.37
VOLTS: 13200.0	SLG:	0.37	0.2 SYM3:	1.00	1.00	2.08	0.37
NACD: 1.000	LN/LN:	1.80	SYM5:	1.00	1.00	2.08	0.37
	LN/LN/GND:	1.89	SYM8:	1.00	1.00	2.08	0.37
	GND RETURN:	0.19	TOT2:	1.03	1.00	2.13	0.37
	Z1(PU):	2.10583	TOT3:	1.00	1.00	2.08	0.37
	Z2(PU):	2.10583	TOT5:	1.00	1.00	2.08	0.37
	Z0(PU):	33.75686	TOT8:	1.00	1.00	2.08	0.37
4B.05.1	3P Duty:	2.08	2.9 SYM2:	1.00	1.00	2.08	0.37
VOLTS: 13200.0	SLG:	0.37	0.2 SYM3:	1.00	1.00	2.08	0.37
NACD: 1.000	LN/LN:	1.80	SYM5:	1.00	1.00	2.08	0.37
	LN/LN/GND:	1.89	SYM8:	1.00	1.00	2.08	0.37
	GND RETURN:	0.19	TOT2:	1.03	1.00	2.13	0.37
	Z1(PU):	2.10586	TOT3:	1.00	1.00	2.08	0.37
	Z2(PU):	2.10586	TOT5:	1.00	1.00	2.08	0.37
	Z0(PU):	33.75691	TOT8:	1.00	1.00	2.08	0.37
4C.01.0	3P Duty:	3.06	3.9 SYM2:	1.00	1.00	3.06	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	3.06	0.38
NACD: 1.000	LN/LN:	2.65	SYM5:	1.00	1.00	3.06	0.38
	LN/LN/GND:	2.74	SYM8:	1.00	1.00	3.06	0.38
	GND RETURN:	0.20	TOT2:	1.04	1.00	3.18	0.38
	Z1(PU):	1.42927	TOT3:	1.00	1.00	3.06	0.38
	Z2(PU):	1.42927	TOT5:	1.00	1.00	3.06	0.38
	Z0(PU):	33.29348	TOT8:	1.00	1.00	3.06	0.38

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	SLG	INTERRUPTING DUTIES (KA) 3 PHASE	SLG
4C.01.1	3P Duty:	3.06	3.9	SYM2: 1.00	1.00	3.06	0.38
VOLTS: 13200.0	SLG:	0.38	0.1	SYM3: 1.00	1.00	3.06	0.38
NACD: 1.000	LN/LN:	2.65		SYM5: 1.00	1.00	3.06	0.38
	LN/LN/GND:	2.74		SYM8: 1.00	1.00	3.06	0.38
	GND RETURN:	0.20		TOT2: 1.04	1.00	3.18	0.38
	Z1(PU):		1.42931	TOT3: 1.00	1.00	3.06	0.38
	Z2(PU):		1.42931	TOT5: 1.00	1.00	3.06	0.38
	Z0(PU):		33.29353	TOT8: 1.00	1.00	3.06	0.38
4C.01.2	3P Duty:	3.06	3.9	SYM2: 1.00	1.00	3.06	0.38
VOLTS: 13200.0	SLG:	0.38	0.1	SYM3: 1.00	1.00	3.06	0.38
NACD: 1.000	LN/LN:	2.65		SYM5: 1.00	1.00	3.06	0.38
	LN/LN/GND:	2.74		SYM8: 1.00	1.00	3.06	0.38
	GND RETURN:	0.20		TOT2: 1.04	1.00	3.18	0.38
	Z1(PU):		1.42931	TOT3: 1.00	1.00	3.06	0.38
	Z2(PU):		1.42931	TOT5: 1.00	1.00	3.06	0.38
	Z0(PU):		33.29353	TOT8: 1.00	1.00	3.06	0.38
4C.02	3P Duty:	3.00	3.5	SYM2: 1.00	1.00	3.00	0.38
VOLTS: 13200.0	SLG:	0.38	0.1	SYM3: 1.00	1.00	3.00	0.38
NACD: 1.000	LN/LN:	2.59		SYM5: 1.00	1.00	3.00	0.38
	LN/LN/GND:	2.69		SYM8: 1.00	1.00	3.00	0.38
	GND RETURN:	0.20		TOT2: 1.03	1.00	3.10	0.38
	Z1(PU):		1.46029	TOT3: 1.00	1.00	3.00	0.38
	Z2(PU):		1.46029	TOT5: 1.00	1.00	3.00	0.38
	Z0(PU):		33.37195	TOT8: 1.00	1.00	3.00	0.38
4C.02.1	3P Duty:	3.00	3.5	SYM2: 1.00	1.00	3.00	0.38
VOLTS: 13200.0	SLG:	0.38	0.1	SYM3: 1.00	1.00	3.00	0.38
NACD: 1.000	LN/LN:	2.59		SYM5: 1.00	1.00	3.00	0.38
	LN/LN/GND:	2.69		SYM8: 1.00	1.00	3.00	0.38
	GND RETURN:	0.20		TOT2: 1.03	1.00	3.10	0.38
	Z1(PU):		1.46032	TOT3: 1.00	1.00	3.00	0.38
	Z2(PU):		1.46032	TOT5: 1.00	1.00	3.00	0.38
	Z0(PU):		33.37200	TOT8: 1.00	1.00	3.00	0.38

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	SLG	INTERRUPTING DUTIES (KA) 3 PHASE	SLG
4C.02.2	3P Duty:	3.00	3.5 SYM2:	1.00	1.00	3.00	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	3.00	0.38
NACD: 1.000	LN/LN:	2.59	SYM5:	1.00	1.00	3.00	0.38
	LN/LN/GND:	2.69	SYM8:	1.00	1.00	3.00	0.38
	GND RETURN:	0.20	TOT2:	1.03	1.00	3.10	0.38
	Z1(PU):	1.46032	TOT3:	1.00	1.00	3.00	0.38
	Z2(PU):	1.46032	TOT5:	1.00	1.00	3.00	0.38
	Z0(PU):	33.37200	TOT8:	1.00	1.00	3.00	0.38
4C.03	3P Duty:	2.92	3.1 SYM2:	1.00	1.00	2.92	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.92	0.38
NACD: 1.000	LN/LN:	2.53	SYM5:	1.00	1.00	2.92	0.38
	LN/LN/GND:	2.62	SYM8:	1.00	1.00	2.92	0.38
	GND RETURN:	0.19	TOT2:	1.03	1.00	3.01	0.38
	Z1(PU):	1.49615	TOT3:	1.00	1.00	2.92	0.38
	Z2(PU):	1.49615	TOT5:	1.00	1.00	2.92	0.38
	Z0(PU):	33.45935	TOT8:	1.00	1.00	2.92	0.38
4C.03.1	3P Duty:	2.92	3.1 SYM2:	1.00	1.00	2.92	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.92	0.38
NACD: 1.000	LN/LN:	2.53	SYM5:	1.00	1.00	2.92	0.38
	LN/LN/GND:	2.62	SYM8:	1.00	1.00	2.92	0.38
	GND RETURN:	0.19	TOT2:	1.03	1.00	3.01	0.38
	Z1(PU):	1.49619	TOT3:	1.00	1.00	2.92	0.38
	Z2(PU):	1.49619	TOT5:	1.00	1.00	2.92	0.38
	Z0(PU):	33.45940	TOT8:	1.00	1.00	2.92	0.38
4C.04	3P Duty:	2.91	3.1 SYM2:	1.00	1.00	2.91	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.91	0.38
NACD: 1.000	LN/LN:	2.52	SYM5:	1.00	1.00	2.91	0.38
	LN/LN/GND:	2.61	SYM8:	1.00	1.00	2.91	0.38
	GND RETURN:	0.19	TOT2:	1.03	1.00	3.00	0.38
	Z1(PU):	1.50117	TOT3:	1.00	1.00	2.91	0.38
	Z2(PU):	1.50117	TOT5:	1.00	1.00	2.91	0.38
	Z0(PU):	33.47133	TOT8:	1.00	1.00	2.91	0.38

U N B A L A N C E D I N T E R R U P T I N G D U T Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

LOCATION	FAULT TYPE	E/Z KA	X/R	ANSI AC/DC DECREMENT FACT. 3 PHASE	ANSI AC/DC DECREMENT FACT. SLG	INTERRUPTING DUTIES (KA) 3 PHASE	INTERRUPTING DUTIES (KA) SLG
4C.04.1	3P Duty:	2.91	3.1 SYM2:	1.00	1.00	2.91	0.38
VOLTS: 13200.0	SLG:	0.38	0.1 SYM3:	1.00	1.00	2.91	0.38
NACD: 1.000	LN/LN:	2.52	SYM5:	1.00	1.00	2.91	0.38
	LN/LN/GND:	2.61	SYM8:	1.00	1.00	2.91	0.38
	GND RETURN:	0.19	TOT2:	1.03	1.00	3.00	0.38
	Z1(PU):	1.50121	TOT3:	1.00	1.00	2.91	0.38
	Z2(PU):	1.50121	TOT5:	1.00	1.00	2.91	0.38
	Z0(PU):	33.47138	TOT8:	1.00	1.00	2.91	0.38
5C.01	3P Duty:	3.28	7.1 SYM2:	1.00	1.00	3.28	0.39
VOLTS: 13200.0	SLG:	0.39	0.1 SYM3:	1.00	1.00	3.28	0.39
NACD: 1.000	LN/LN:	2.84	SYM5:	1.00	1.00	3.28	0.39
	LN/LN/GND:	2.93	SYM8:	1.00	1.00	3.28	0.39
	GND RETURN:	0.20	TOT2:	1.12	1.00	3.67	0.39
	Z1(PU):	1.33482	TOT3:	1.01	1.00	3.31	0.39
	Z2(PU):	1.33482	TOT5:	1.00	1.00	3.28	0.39
	Z0(PU):	33.02034	TOT8:	1.00	1.00	3.28	0.39
5C.01.1	3P Duty:	3.27	7.0 SYM2:	1.00	1.00	3.27	0.39
VOLTS: 13200.0	SLG:	0.39	0.1 SYM3:	1.00	1.00	3.27	0.39
NACD: 1.000	LN/LN:	2.83	SYM5:	1.00	1.00	3.27	0.39
	LN/LN/GND:	2.93	SYM8:	1.00	1.00	3.27	0.39
	GND RETURN:	0.20	TOT2:	1.11	1.00	3.65	0.39
	Z1(PU):	1.33666	TOT3:	1.01	1.00	3.29	0.39
	Z2(PU):	1.33666	TOT5:	1.00	1.00	3.27	0.39
	Z0(PU):	33.02945	TOT8:	1.00	1.00	3.27	0.39
5C.01.2	3P Duty:	3.28	7.1 SYM2:	1.00	1.00	3.28	0.39
VOLTS: 13200.0	SLG:	0.39	0.1 SYM3:	1.00	1.00	3.28	0.39
NACD: 1.000	LN/LN:	2.84	SYM5:	1.00	1.00	3.28	0.39
	LN/LN/GND:	2.93	SYM8:	1.00	1.00	3.28	0.39
	GND RETURN:	0.20	TOT2:	1.12	1.00	3.67	0.39
	Z1(PU):	1.33517	TOT3:	1.01	1.00	3.31	0.39
	Z2(PU):	1.33517	TOT5:	1.00	1.00	3.28	0.39
	Z0(PU):	33.02177	TOT8:	1.00	1.00	3.28	0.39

I N T E R R U P T I N G D U T Y S U M M A R Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

BUS RECORD NO NAME	VOLTAGE L-L	NACD RATIO	* 3 P H A S E * E/Z KA	X/R	* * * S L G * * * E/Z KA	X/R
0.000	34500.	1.000	6.303	7.18	6.204	7.72
0.01	34500.	1.000	6.299	7.11	6.195	7.64
0.02	34500.	1.000	6.299	7.11	6.195	7.64
0.03	34500.	1.000	6.299	7.11	6.195	7.64
0.1	13200.	1.000	2.506	12.85	0.392	0.15
0.1.1	13200.	1.000	2.505	12.78	0.392	0.15
0.1.2	13200.	1.000	2.415	8.70	0.389	0.16
0.2	13200.	1.000	2.506	12.85	0.392	0.15
0.2.1	13200.	1.000	2.505	12.78	0.392	0.15
0.2.2	13200.	1.000	2.415	8.70	0.389	0.16
0.3	13200.	1.000	3.472	12.06	0.394	0.11
0.3.1	13200.	1.000	3.469	11.96	0.394	0.11
0.3.2	13200.	1.000	3.300	7.54	0.391	0.11
0A	13200.	1.000	2.415	8.70	0.389	0.16
0B	13200.	1.000	2.415	8.70	0.389	0.16
0C	13200.	1.000	3.300	7.54	0.391	0.11
1A.01	13200.	1.000	2.411	8.50	0.389	0.16
1A.01A	13200.	1.000	2.406	8.23	0.388	0.16
1A.01A.1	13200.	1.000	2.406	8.23	0.388	0.16
1A.01A.2	13200.	1.000	2.406	8.23	0.388	0.16
1A.02	13200.	1.000	2.304	5.09	0.382	0.16
1A.02.1	13200.	1.000	2.304	5.09	0.382	0.16
1A.03	13200.	1.000	2.278	4.66	0.380	0.16
1A.03.1	13200.	1.000	2.278	4.66	0.380	0.16
1A.04	13200.	1.000	2.263	4.44	0.379	0.16
1A.04.1	13200.	1.000	2.263	4.44	0.379	0.16
1B.01	13200.	1.000	2.303	5.06	0.382	0.16
1B.01.1	13200.	1.000	2.303	5.06	0.382	0.16
1B.02	13200.	1.000	2.253	4.31	0.379	0.17
1B.02.1	13200.	1.000	2.253	4.31	0.379	0.17
1B.03	13200.	1.000	2.235	4.10	0.378	0.17
1B.03.1	13200.	1.000	2.235	4.10	0.378	0.17
2A.01	13200.	1.000	2.344	5.94	0.384	0.16
2A.01.1	13200.	1.000	2.344	5.94	0.384	0.16
2A.02	13200.	1.000	2.286	4.77	0.381	0.16
2A.02.1	13200.	1.000	2.285	4.77	0.381	0.16
2A.03	13200.	1.000	2.254	4.33	0.379	0.17
2A.03.1	13200.	1.000	2.254	4.33	0.379	0.17
2C.01	13200.	1.000	3.074	4.02	0.384	0.12
2C.01.1	13200.	1.000	3.074	4.02	0.384	0.12
2C.02	13200.	1.000	3.034	3.74	0.383	0.12
2C.02.1	13200.	1.000	3.034	3.74	0.383	0.12
2C.03	13200.	1.000	2.985	3.44	0.381	0.12
2C.03.1	13200.	1.000	2.985	3.44	0.381	0.12
2C.03.2	13200.	1.000	2.985	3.44	0.381	0.12

2C.04	13200.	1.000	2.892	2.99	0.378	0.13

I N T E R R U P T I N G D U T Y S U M M A R Y R E P O R T

PRE FAULT VOLTAGE: 1.0000
MODEL TRANSFORMER TAPS: NO
NACD OPTION: INTERPOLATED

BUS RECORD NO NAME	VOLTAGE L-L	NACD RATIO	* 3 P H A S E * E/Z KA	X/R	* * * S L G * * * E/Z KA	X/R
2C.04.1	13200.	1.000	2.892	2.99	0.378	0.13
3B.01	13200.	1.000	2.294	4.90	0.381	0.16
3B.01.1	13200.	1.000	2.294	4.90	0.381	0.16
3B.02	13200.	1.000	2.277	4.63	0.380	0.16
3B.02.1	13200.	1.000	2.277	4.63	0.380	0.16
3B.03	13200.	1.000	2.259	4.40	0.379	0.16
3B.03.1	13200.	1.000	2.259	4.40	0.379	0.16
3B.04	13200.	1.000	2.209	3.82	0.376	0.17
3B.04.1	13200.	1.000	2.209	3.82	0.376	0.17
3C.01	13200.	1.000	3.069	3.99	0.384	0.12
3C.01.1	13200.	1.000	3.069	3.99	0.384	0.12
3C.02	13200.	1.000	2.975	3.38	0.381	0.12
3C.02.1	13200.	1.000	2.975	3.38	0.381	0.12
3C.03	13200.	1.000	2.950	3.26	0.380	0.12
3C.03.1	13200.	1.000	2.950	3.26	0.380	0.12
3C.04	13200.	1.000	2.850	2.83	0.377	0.13
3C.04.1	13200.	1.000	2.850	2.83	0.377	0.13
4B.01	13200.	1.000	2.177	3.54	0.374	0.17
4B.01.1	13200.	1.000	2.177	3.54	0.374	0.17
4B.02	13200.	1.000	2.134	3.23	0.372	0.17
4B.02.1	13200.	1.000	2.134	3.23	0.372	0.17
4B.04	13200.	1.000	2.112	3.08	0.371	0.17
4B.04.1	13200.	1.000	2.111	3.08	0.371	0.17
4B.05	13200.	1.000	2.077	2.89	0.369	0.17
4B.05.1	13200.	1.000	2.077	2.89	0.369	0.17
4C.01.0	13200.	1.000	3.060	3.92	0.383	0.12
4C.01.1	13200.	1.000	3.060	3.92	0.383	0.12
4C.01.2	13200.	1.000	3.060	3.92	0.383	0.12
4C.02	13200.	1.000	2.995	3.50	0.381	0.12
4C.02.1	13200.	1.000	2.995	3.50	0.381	0.12
4C.02.2	13200.	1.000	2.995	3.50	0.381	0.12
4C.03	13200.	1.000	2.923	3.13	0.379	0.12
4C.03.1	13200.	1.000	2.923	3.13	0.379	0.12
4C.04	13200.	1.000	2.914	3.09	0.379	0.12
4C.04.1	13200.	1.000	2.914	3.09	0.379	0.12
5C.01	13200.	1.000	3.277	7.14	0.391	0.11
5C.01.1	13200.	1.000	3.272	6.97	0.390	0.11
5C.01.2	13200.	1.000	3.276	7.12	0.391	0.11

84 FAULTED BUSES, 134 BRANCHES, 2 CONTRIBUTIONS
UNBALANCED FAULTS REQUESTED

*** SHORT CIRCUIT STUDY COMPLETE ***

7.0 INPUT DATA REPORT

SUNY OSWEGO
35kV SUB EXPANSION

ALL INFORMATION PRESENTED IS FOR REVIEW, APPROVAL
INTERPRETATION AND APPLICATION BY A REGISTERED ENGINEER ONLY
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FROM THE USE AND INTERPRETATION OF THIS SOFTWARE.

SKM POWER*TOOLS FOR WINDOWS
INPUT DATA REPORT

ALL PU VALUES ARE EXPRESSED ON A 100 MVA BASE.

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE	
CBL-001	0.1	0.1.1	1	13200	25.0	FEET	250	Copper	
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:	
	+/- Impedance: 0.0547 + J 0.0456 Ohms/1000 ft						0.00078 + J 0.00065 PU		
	Z0 Impedance: 0.0869 + J 0.1160 Ohms/1000 ft						0.0012 + J 0.0017 PU		
CBL-002	0.1.1	0.1.2	1	13200	2250.0	FEET	250	Copper	
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:	
	+/- Impedance: 0.0547 + J 0.0456 Ohms/1000 ft						0.0706 + J 0.0589 PU		
	Z0 Impedance: 0.0869 + J 0.1160 Ohms/1000 ft						0.1122 + J 0.1498 PU		
CBL-003	0.1.2	0B	1	13200	1.000	FEET	1200	Copper	
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:	Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU		
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU		
CBL-006	0B	4B.01	1	13200	4620.0	FEET	1/0	Copper	
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:	
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.3394 + J 0.1344 PU		
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.5393 + J 0.3418 PU		
CBL-007	0B	3B.01	1	13200	2370.0	FEET	1/0	Copper	
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:	
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.1741 + J 0.0690 PU		
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.2767 + J 0.1753 PU		
CBL-008	4B.01	4B.02	1	13200	820.0	FEET	1/0	Copper	
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:	
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.0602 + J 0.0239 PU		
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.0957 + J 0.0607 PU		
CBL-010	4B.01	4B.01.1	1	13200	1.000	FEET	600	Copper	
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:	Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU		
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU		
CBL-011	3B.01	3B.01.1	1	13200	1.000	FEET	600	Copper	
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:	Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU		
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU		
CBL-012	4B.02	4B.04	1	13200	440.0	FEET	1/0	Copper	
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:	
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.0323 + J 0.0128 PU		
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.0514 + J 0.0326 PU		

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE		
CBL-013	4B.02	4B.02.1	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:		Class B	
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			
CBL-014	3B.02	3B.03	1	13200	330.0	FEET	1/0	Copper		
	Duct Material:	Non-Magnetic	Insulation Type:		XLP		Insulation Class:			
	+/- Impedance:	0.1280 + J 0.0507	Ohms/1000 ft		0.0242 + J 0.0096		PU			
	Z0 Impedance:	0.2034 + J 0.1289	Ohms/1000 ft		0.0385 + J 0.0244		PU			
CBL-015	3B.02	3B.02.1	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:		Class B	
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			
CBL-017	3B.03	3B.04	1	13200	975.0	FEET	1/0	Copper		
	Duct Material:	Non-Magnetic	Insulation Type:		XLP		Insulation Class:			
	+/- Impedance:	0.1280 + J 0.0507	Ohms/1000 ft		0.0716 + J 0.0284		PU			
	Z0 Impedance:	0.2034 + J 0.1289	Ohms/1000 ft		0.1138 + J 0.0721		PU			
CBL-018	3B.03	3B.03.1	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:		Class B	
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			
CBL-019	4B.04	4B.05	1	13200	675.0	FEET	1/0	Copper		
	Duct Material:	Non-Magnetic	Insulation Type:		XLP		Insulation Class:			
	+/- Impedance:	0.1280 + J 0.0507	Ohms/1000 ft		0.0496 + J 0.0196		PU			
	Z0 Impedance:	0.2034 + J 0.1289	Ohms/1000 ft		0.0788 + J 0.0499		PU			
CBL-020	4B.04	4B.04.1	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:		Class B	
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			
CBL-022	3B.04	3B.04.1	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:		Class B	
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			
CBL-0237	1B.02	1B.02.1	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:		Class B	
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE		
CBL-0238	1B.03	1B.03.1	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:			Class B
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			
CBL-024	4B.05	4B.05.1	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:			Class B
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			
CBL-025	0B	1B.01	1	13200	2200.0	FEET	1/0	Copper		
	Duct Material:	Non-Magnetic	Insulation Type:		XLP		Insulation Class:			
	+/- Impedance:	0.1280 + J 0.0507	Ohms/1000 ft		0.1616 + J 0.0640		PU			
	Z0 Impedance:	0.2034 + J 0.1289	Ohms/1000 ft		0.2568 + J 0.1628		PU			
CBL-026	0A	1A.01	1	13200	70.0	FEET	1/0	Copper		
	Duct Material:	Non-Magnetic	Insulation Type:		XLP		Insulation Class:			
	+/- Impedance:	0.1280 + J 0.0507	Ohms/1000 ft		0.0051 + J 0.0020		PU			
	Z0 Impedance:	0.2034 + J 0.1289	Ohms/1000 ft		0.0082 + J 0.0052		PU			
CBL-027	1B.01	1B.01.1	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:			Class B
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			
CBL-028	1B.01	1B.02	1	13200	950.0	FEET	1/0	Copper		
	Duct Material:	Non-Magnetic	Insulation Type:		XLP		Insulation Class:			
	+/- Impedance:	0.1280 + J 0.0507	Ohms/1000 ft		0.0698 + J 0.0276		PU			
	Z0 Impedance:	0.2034 + J 0.1289	Ohms/1000 ft		0.1109 + J 0.0703		PU			
CBL-0281	1A01A.1.3	1A01A.1.4	2	480	30.0	FEET	600	Copper		
	Duct Material:	Magnetic	Insulation Type:		PVC		Insulation Class:			THHN
	+/- Impedance:	0.0257 + J 0.0463	Ohms/1000 ft		0.1673 + J 0.3014		PU			
	Z0 Impedance:	0.0809 + J 0.1140	Ohms/1000 ft		0.5267 + J 0.7422		PU			
CBL-0282	G01.1	G01.1.2	2	480	240.0	FEET	600	Copper		
	Duct Material:	Magnetic	Insulation Type:		PVC		Insulation Class:			THHN
	+/- Impedance:	0.0257 + J 0.0463	Ohms/1000 ft		1.34 + J 2.41		PU			
	Z0 Impedance:	0.0809 + J 0.1140	Ohms/1000 ft		4.21 + J 5.94		PU			
CBL-0283	G01	G01.1	2	480	30.0	FEET	600	Copper		
	Duct Material:	Magnetic	Insulation Type:		PVC		Insulation Class:			THHN
	+/- Impedance:	0.0257 + J 0.0463	Ohms/1000 ft		0.1673 + J 0.3014		PU			
	Z0 Impedance:	0.0809 + J 0.1140	Ohms/1000 ft		0.5267 + J 0.7422		PU			

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE		
CBL-0284	G01	G01.2	2	480	30.0	FEET	600	Copper		
	Duct Material:	Magnetic	Insulation Type:		PVC		Insulation Class:		THHN	
	+/- Impedance:	0.0257 + J 0.0463	Ohms/1000 ft		0.1673 + J 0.3014	PU				
	Z0 Impedance:	0.0809 + J 0.1140	Ohms/1000 ft		0.5267 + J 0.7422	PU				
CBL-0287	1A01A.1.1	1A01A.1.2	2	480	60.0	FEET	600	Copper		
	Duct Material:	Magnetic	Insulation Type:		PVC		Insulation Class:		THHN	
	+/- Impedance:	0.0257 + J 0.0463	Ohms/1000 ft		0.3346 + J 0.6029	PU				
	Z0 Impedance:	0.0809 + J 0.1140	Ohms/1000 ft		1.05 + J 1.48	PU				
CBL-0288	1A01A.1	1A01A.1.1	1	480	10.0	FEET	1600	Copper		
	Duct Material:	Bus	Insulation Type:		****		Insulation Class:			
	+/- Impedance:	0.0092 + J 0.0048	Ohms/1000 ft		0.0399 + J 0.0208	PU				
	Z0 Impedance:	0.0547 + J 0.0257	Ohms/1000 ft		0.2374 + J 0.1115	PU				
CBL-029	1A.01	1A.02	1	13200	2100.0	FEET	1/0	Copper		
	Duct Material:	Non-Magnetic	Insulation Type:		XLP		Insulation Class:			
	+/- Impedance:	0.1280 + J 0.0507	Ohms/1000 ft		0.1543 + J 0.0611	PU				
	Z0 Impedance:	0.2034 + J 0.1289	Ohms/1000 ft		0.2451 + J 0.1554	PU				
CBL-0290	1A01A.1.4	1A01A.1.4.2	1	480	10.0	FEET	300	Copper		
	Duct Material:	Magnetic	Insulation Type:		PVC		Insulation Class:		THHN	
	+/- Impedance:	0.0464 + J 0.0377	Ohms/1000 ft		0.2014 + J 0.1636	PU				
	Z0 Impedance:	0.1462 + J 0.0928	Ohms/1000 ft		0.6345 + J 0.4028	PU				
CBL-0291	1A01A.1.4	1A01A.1.4.1	1	480	100.0	FEET	600	Copper		
	Duct Material:	Magnetic	Insulation Type:		PVC		Insulation Class:		THHN	
	+/- Impedance:	0.0257 + J 0.0343	Ohms/1000 ft		1.12 + J 1.49	PU				
	Z0 Impedance:	0.0809 + J 0.0845	Ohms/1000 ft		3.51 + J 3.67	PU				
CBL-0292	1A01A1.4.2	1A01A1.4.3	2	208	10.0	FEET	600	Copper		
	Duct Material:	Magnetic	Insulation Type:		PVC		Insulation Class:		THHN	
	+/- Impedance:	0.0257 + J 0.0343	Ohms/1000 ft		0.2970 + J 0.3964	PU				
	Z0 Impedance:	0.0809 + J 0.0845	Ohms/1000 ft		0.9350 + J 0.9766	PU				
CBL-030	1A.01A	1A.01A.1	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:		Class B	
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004	PU				
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019	PU				
CBL-031	1A.01A	1A.01A.2	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:		Class B	
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004	PU				
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019	PU				

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE		
CBL-032	1A.02	1A.03	1	13200	500.0	FEET	1/0	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.0367 + J 0.0145 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.0584 + J 0.0370 PU			
CBL-033	1A.02	1A.02.1	1	13200	1.000	FEET	600	Copper		
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:		Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			
CBL-034	1A.03	1A.04	1	13200	300.0	FEET	1/0	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.0220 + J 0.0087 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.0350 + J 0.0222 PU			
CBL-035	1A.03	1A.03.1	1	13200	1.000	FEET	600	Copper		
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:		Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			
CBL-036	1A.04	1A.04.1	1	13200	1.000	FEET	600	Copper		
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:		Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			
CBL-037	0A	2A.01	1	13200	1400.0	FEET	1/0	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.1028 + J 0.0407 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.1634 + J 0.1036 PU			
CBL-038	2A.01	2A.02	1	13200	1130.0	FEET	1/0	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.0830 + J 0.0329 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.1319 + J 0.0836 PU			
CBL-039	2A.01	2A.01.1	1	13200	1.000	FEET	600	Copper		
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:		Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			
CBL-040	2A.02	2A.03	1	13200	600.0	FEET	1/0	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.0441 + J 0.0175 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.0700 + J 0.0444 PU			

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE		
CBL-041	2A.02	2A.02.1	1	13200	1.000	FEET	600	Copper		
	Duct Material: Busway		Insulation Type: Epoxy				Insulation Class:		Class B	
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			
CBL-043	2A.03	2A.03.1	1	13200	1.000	FEET	600	Copper		
	Duct Material: Busway		Insulation Type: Epoxy				Insulation Class:		Class B	
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			
CBL-045	0C	5C.01	1	13200	300.0	FEET	4/0	Copper		
	Duct Material: Non-Magnetic		Insulation Type: XLP				Insulation Class:			
	+/- Impedance: 0.0640 + J 0.0466 Ohms/1000 ft						0.0110 + J 0.0080 PU			
	Z0 Impedance: 0.1017 + J 0.1185 Ohms/1000 ft						0.0175 + J 0.0204 PU			
CBL-046	5C.01	5C.01.1	1	13200	40.0	FEET	2	Copper		
	Duct Material: Non-Magnetic		Insulation Type: EPR				Insulation Class:		MV	
	+/- Impedance: 0.2026 + J 0.0519 Ohms/1000 ft						0.0047 + J 0.0012 PU			
	Z0 Impedance: 0.3940 + J 0.0860 Ohms/1000 ft						0.0090 + J 0.0020 PU			
CBL-047	5C.01	5C.01.2	1	13200	10.0	FEET	2/0	Copper		
	Duct Material: Non-Magnetic		Insulation Type: EPR				Insulation Class:		MV	
	+/- Impedance: 0.1016 + J 0.0465 Ohms/1000 ft						0.00058 + J 0.00027 PU			
	Z0 Impedance: 0.2470 + J 0.0570 Ohms/1000 ft						0.0014 + J 0.00033 PU			
CBL-048	5C01.1	5C01.1.2	1	480	20.0	FEET	3000	Copper		
	Duct Material: Bus		Insulation Type: ****				Insulation Class:			
	+/- Impedance: 0.0046 + J 0.0026 Ohms/1000 ft						0.0399 + J 0.0226 PU			
	Z0 Impedance: 0.0273 + J 0.0139 Ohms/1000 ft						0.2370 + J 0.1207 PU			
CBL-049	5C01.2	5C012.1	1	480	20.0	FEET	3000	Copper		
	Duct Material: Bus		Insulation Type: ****				Insulation Class:			
	+/- Impedance: 0.0046 + J 0.0026 Ohms/1000 ft						0.0399 + J 0.0226 PU			
	Z0 Impedance: 0.0273 + J 0.0139 Ohms/1000 ft						0.2370 + J 0.1207 PU			
CBL-050	0C	2C.01	1	13200	2300.0	FEET	1/0	Copper		
	Duct Material: Non-Magnetic		Insulation Type: XLP				Insulation Class:			
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.1690 + J 0.0669 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.2685 + J 0.1702 PU			
CBL-051	2C.01	2C.01.1	1	13200	1.000	FEET	600	Copper		
	Duct Material: Busway		Insulation Type: Epoxy				Insulation Class:		Class B	
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE		
CBL-052	2C.01	2C.02	1	13200	400.0	FEET	1/0	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.0294 + J 0.0116 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.0467 + J 0.0296 PU			
CBL-053	2C.02	2C.02.1	1	13200	1.000	FEET	600	Copper		
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:		Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			
CBL-054	2C.02	2C.03	1	13200	500.0	FEET	1/0	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.0367 + J 0.0145 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.0584 + J 0.0370 PU			
CBL-055	2C.03	2C.03.1	1	13200	1.000	FEET	600	Copper		
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:		Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			
CBL-056	2C.03	2C.03.2	1	13200	1.000	FEET	600	Copper		
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:		Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			
CBL-057	2C.03	2C.04	1	13200	950.0	FEET	1/0	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.0698 + J 0.0276 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.1109 + J 0.0703 PU			
CBL-058	2C.04	2C.04.1	1	13200	1.000	FEET	600	Copper		
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:		Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			
CBL-059	0C	3C.01	1	13200	2350.0	FEET	1/0	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.1726 + J 0.0684 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.2743 + J 0.1738 PU			
CBL-060	3C.01	3C.01.1	1	13200	1.000	FEET	600	Copper		
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:		Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE
CBL-061	3C.01	3C.02	1	13200	950.0	FEET	1/0	Copper
	Duct Material: Non-Magnetic		Insulation Type:		XLP		Insulation Class:	
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft				0.0698 + J 0.0276 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft				0.1109 + J 0.0703 PU			
CBL-062	3C.02	3C.02.1	1	13200	1.000	FEET	600	Copper
	Duct Material: Busway		Insulation Type:		Epoxy		Insulation Class:	Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft				0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft				0.00004 + J 0.00019 PU			
CBL-063	3C.02	3C.03	1	13200	250.0	FEET	1/0	Copper
	Duct Material: Non-Magnetic		Insulation Type:		XLP		Insulation Class:	
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft				0.0184 + J 0.0073 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft				0.0292 + J 0.0185 PU			
CBL-064	3C.03	3C.03.1	1	13200	1.000	FEET	600	Copper
	Duct Material: Busway		Insulation Type:		Epoxy		Insulation Class:	Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft				0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft				0.00004 + J 0.00019 PU			
CBL-065	3C.03	3C.04	1	13200	1031.0	FEET	1/0	Copper
	Duct Material: Non-Magnetic		Insulation Type:		XLP		Insulation Class:	
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft				0.0757 + J 0.0300 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft				0.1204 + J 0.0763 PU			
CBL-066	3C.04	3C.04.1	1	13200	1.000	FEET	600	Copper
	Duct Material: Busway		Insulation Type:		Epoxy		Insulation Class:	Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft				0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft				0.00004 + J 0.00019 PU			
CBL-067	0C	4C.01.0	1	13200	2440.0	FEET	1/0	Copper
	Duct Material: Non-Magnetic		Insulation Type:		XLP		Insulation Class:	
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft				0.1792 + J 0.0710 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft				0.2848 + J 0.1805 PU			
CBL-068	4C.01.0	4C.02	1	13200	656.0	FEET	1/0	Copper
	Duct Material: Non-Magnetic		Insulation Type:		XLP		Insulation Class:	
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft				0.0482 + J 0.0191 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft				0.0766 + J 0.0485 PU			
CBL-069	4C.01.0	4C.01.1	1	13200	1.000	FEET	600	Copper
	Duct Material: Busway		Insulation Type:		Epoxy		Insulation Class:	Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft				0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft				0.00004 + J 0.00019 PU			

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE		
CBL-070	4C.01.0	4C.01.2	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:		Class B	
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			
CBL-071	4C.02	4C.03	1	13200	730.0	FEET	1/0	Copper		
	Duct Material:	Non-Magnetic	Insulation Type:		XLP		Insulation Class:			
	+/- Impedance:	0.1280 + J 0.0507	Ohms/1000 ft		0.0536 + J 0.0212		PU			
	Z0 Impedance:	0.2034 + J 0.1289	Ohms/1000 ft		0.0852 + J 0.0540		PU			
CBL-072	4C.02	4C.02.1	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:		Class B	
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			
CBL-073	4C.02	4C.02.2	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:		Class B	
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			
CBL-074	4C.03	4C.04	1	13200	100.0	FEET	1/0	Copper		
	Duct Material:	Non-Magnetic	Insulation Type:		XLP		Insulation Class:			
	+/- Impedance:	0.1280 + J 0.0507	Ohms/1000 ft		0.0073 + J 0.0029		PU			
	Z0 Impedance:	0.2034 + J 0.1289	Ohms/1000 ft		0.0117 + J 0.0074		PU			
CBL-075	1A.01	1A.01A	1	13200	100.0	FEET	1/0	Copper		
	Duct Material:	Non-Magnetic	Insulation Type:		XLP		Insulation Class:			
	+/- Impedance:	0.1280 + J 0.0507	Ohms/1000 ft		0.0073 + J 0.0029		PU			
	Z0 Impedance:	0.2034 + J 0.1289	Ohms/1000 ft		0.0117 + J 0.0074		PU			
CBL-076	4C.03	4C.03.1	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:		Class B	
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			
CBL-077	4C.04	4C.04.1	1	13200	1.000	FEET	600	Copper		
	Duct Material:	Busway	Insulation Type:		Epoxy		Insulation Class:		Class B	
	+/- Impedance:	0.0119 + J 0.0619	Ohms/1000 ft		0.00001 + J 0.00004		PU			
	Z0 Impedance:	0.0710 + J 0.3314	Ohms/1000 ft		0.00004 + J 0.00019		PU			
CBL-079	0.2	0.2.1	1	13200	25.0	FEET	250	Copper		
	Duct Material:	Non-Magnetic	Insulation Type:		XLP		Insulation Class:			
	+/- Impedance:	0.0547 + J 0.0456	Ohms/1000 ft		0.00078 + J 0.00065		PU			
	Z0 Impedance:	0.0869 + J 0.1160	Ohms/1000 ft		0.0012 + J 0.0017		PU			

FEEDER INPUT DATA

CABLE NAME	FEEDER FROM NAME	FEEDER TO NAME	QTY /PH	VOLTS L-L	LENGTH		FEEDER SIZE	TYPE		
CBL-080	0.2.1	0.2.2	1	13200	2250.0	FEET	250	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.0547 + J 0.0456 Ohms/1000 ft						0.0706 + J 0.0589 PU			
	Z0 Impedance: 0.0869 + J 0.1160 Ohms/1000 ft						0.1122 + J 0.1498 PU			
CBL-081	0.2.2	0A	1	13200	1.000	FEET	1200	Copper		
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:		Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			
CBL-082	0.3	0.3.1	1	13200	30.0	FEET	250	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.0547 + J 0.0456 Ohms/1000 ft						0.00094 + J 0.00079 PU			
	Z0 Impedance: 0.0869 + J 0.1160 Ohms/1000 ft						0.0015 + J 0.0020 PU			
CBL-083	0.3.1	0.3.2	1	13200	2200.0	FEET	250	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.0547 + J 0.0456 Ohms/1000 ft						0.0691 + J 0.0576 PU			
	Z0 Impedance: 0.0869 + J 0.1160 Ohms/1000 ft						0.1097 + J 0.1465 PU			
CBL-084	0.3.2	0C	1	13200	1.000	FEET	1200	Copper		
	Duct Material: Busway			Insulation Type:			Epoxy	Insulation Class:		Class B
	+/- Impedance: 0.0119 + J 0.0619 Ohms/1000 ft						0.00001 + J 0.00004 PU			
	Z0 Impedance: 0.0710 + J 0.3314 Ohms/1000 ft						0.00004 + J 0.00019 PU			
CBL-085	1B.02	1B.03	1	13200	350.0	FEET	1/0	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.0257 + J 0.0102 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.0409 + J 0.0259 PU			
CBL-087	3B.01	3B.02	1	13200	330.0	FEET	1/0	Copper		
	Duct Material: Non-Magnetic			Insulation Type:			XLP	Insulation Class:		
	+/- Impedance: 0.1280 + J 0.0507 Ohms/1000 ft						0.0242 + J 0.0096 PU			
	Z0 Impedance: 0.2034 + J 0.1289 Ohms/1000 ft						0.0385 + J 0.0244 PU			

T R A N S M I S S I O N L I N E

TRANSMISSION LINE NAME	FROM BUS NAME	TO BUS NAME	QTY /PH	VOLTS L-L	LENGTH
XLN-0001	0.000	0.01	1	34500.00	0.0038 Miles
	+ Seq Impedance: 0.000361722 + J 0.000130237 Per Unit; Equi. Shunt B/2: 1.47213e-007				
	0 Seq Impedance: 0.000453095 + J 0.000710657 Per Unit; Equi. Shunt B/2:				
	% SERIES COMP: 0 From Shunt(MVA): 0.0000 To Shunt(MVA): 0.0000				
XLN-0003	0.000	0.02	1	34500.00	0.0038 Miles
	+ Seq Impedance: 0.000361722 + J 0.000130237 Per Unit; Equi. Shunt B/2: 1.47213e-007				
	0 Seq Impedance: 0.000453095 + J 0.000710657 Per Unit; Equi. Shunt B/2:				
	% SERIES COMP: 0 From Shunt(MVA): 0.0000 To Shunt(MVA): 0.0000				
XLN-0004	0.000	0.03	1	34500.00	0.0038 Miles
	+ Seq Impedance: 0.000361722 + J 0.000130237 Per Unit; Equi. Shunt B/2: 1.47213e-007				
	0 Seq Impedance: 0.000453095 + J 0.000710657 Per Unit; Equi. Shunt B/2:				
	% SERIES COMP: 0 From Shunt(MVA): 0.0000 To Shunt(MVA): 0.0000				

TRANSFORMER INPUT DATA

TRANSFORMER NAME	PRIMARY RECORD NO	NAME	VOLTS L-L	* SECONDARY RECORD NO	NAME	VOLTS L-L	FULL-LOAD KVA	NOMINAL KVA
CAMP CENT XFMR	2A.01.1	D	13200.0	2A01.1	YG	208.00	750.00	750.00
	Pos. Seq. Z%:	1.09 + J 5.74	(Zpu 1.46 + j 7.65)	Shell Type				
	Zero Seq. Z%:	1.09 + J 5.74	(Sec 1.46 + j 7.65 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
CAYUGA XFMR	4B.05.1	D	13200.0	4B05.1	YG	208.00	300.00	300.00
	Pos. Seq. Z%:	1.15 + J 5.19	(Zpu 3.85 + j 17.31)	Shell Type				
	Zero Seq. Z%:	1.15 + J 5.19	(Sec 3.85 + j 17.31 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
CONVOCATION	3B.01.1	D	13200.0	3B01.1	YG	480.00	1333.00	1000.00
	Pos. Seq. Z%:	0.922 + J 5.27	(Zpu 0.922 + j 5.27)	Shell Type				
	Zero Seq. Z%:	0.922 + J 5.27	(Sec 0.922 + j 5.27 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
COOPER XFMR	3C.02.1	D	13200.0	3C02.1	YG	208.00	500.00	500.00
	Pos. Seq. Z%:	1.14 + J 5.33	(Zpu 2.27 + j 10.66)	Shell Type				
	Zero Seq. Z%:	1.14 + J 5.33	(Sec 2.27 + j 10.66 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
CULK XFMR	3C.04.1	D	13200.0	3C04.1	YG	480.00	2000.00	2000.00
	Pos. Seq. Z%:	0.659 + J 5.28	(Zpu 0.330 + j 2.64)	Shell Type				
	Zero Seq. Z%:	0.659 + J 5.28	(Sec 0.330 + j 2.64 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
EPL-1 Xfmr	1A01A.1.4.2	D	480.00	1A01A1.4.2	YG	208.00	225.00	225.00
	Pos. Seq. Z%:	1.29 + J 5.01	(Zpu 5.71 + j 22.26)	Shell Type				
	Zero Seq. Z%:	1.29 + J 5.01	(Sec 5.71 + j 22.26 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							

TRANSFORMER INPUT DATA

TRANSFORMER NAME	PRIMARY RECORD NO	NAME	VOLTS L-L	* SECONDARY RECORD NO	NAME	VOLTS L-L	FULL-LOAD KVA	NOMINAL KVA
FUNNELL XFMR	3C.01.1	D	13200.0	3C01.1	YG	208.00	300.00	300.00
	Pos. Seq. Z%:		1.29 + J 5.37	(Zpu	4.31 + j 17.89)	Shell Type		
	Zero Seq. Z%:		1.29 + J 5.37	(Sec	4.31 + j 17.89	Pri Open)		
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
HART XFMR	3C.03.1	D	13200.0	3C03.1	YG	208.00	300.00	300.00
	Pos. Seq. Z%:		1.28 + J 5.30	(Zpu	4.26 + j 17.66)	Shell Type		
	Zero Seq. Z%:		1.28 + J 5.30	(Sec	4.26 + j 17.66	Pri Open)		
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
HEW 1 XFMR	4C.01.1	D	13200.0	4C01.1	YG	208.00	1000.00	1000.00
	Pos. Seq. Z%:		0.874 + J 5.25	(Zpu	0.874 + j 5.25)	Shell Type		
	Zero Seq. Z%:		0.874 + J 5.25	(Sec	0.874 + j 5.25	Pri Open)		
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
HEW 2 XFMR	4C.01.2	D	13200.0	4C01.2	YG	480.00	500.00	500.00
	Pos. Seq. Z%:		1.15 + J 5.19	(Zpu	2.31 + j 10.39)	Shell Type		
	Zero Seq. Z%:		1.15 + J 5.19	(Sec	2.31 + j 10.39	Pri Open)		
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
JOHNS XFMR	1A.03.1	D	13200.0	1A03.1	YG	208.00	1000.00	1000.00
	Pos. Seq. Z%:		1.06 + J 6.04	(Zpu	1.06 + j 6.04)	Shell Type		
	Zero Seq. Z%:		1.06 + J 6.04	(Sec	1.06 + j 6.04	Pri Open)		
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
LAKE XFMR	1A.04.1	D	13200.0	1A04.1	YG	208.00	500.00	500.00
	Pos. Seq. Z%:		1.04 + J 4.89	(Zpu	2.08 + j 9.78)	Shell Type		
	Zero Seq. Z%:		1.04 + J 4.89	(Sec	2.08 + j 9.78	Pri Open)		
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							

TRANSFORMER INPUT DATA

TRANSFORMER NAME	PRIMARY RECORD NO	NAME	VOLTS L-L	* SECONDARY RECORD NO	NAME	VOLTS L-L	FULL-LOAD KVA	NOMINAL KVA
LAN XFMR	3B.03.1	D	13200.0	3B03.1	YG	208.00	1000.00	1000.00
	Pos. Seq. Z%:	0.874 + J 5.25	(Zpu	0.874 + j 5.25)	Shell Type			
	Zero Seq. Z%:	0.874 + J 5.25	(Sec	0.874 + j 5.25	Pri Open)			
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leading Sec.):	30.00 Deg.				
LEE 208	1A.01A.2	D	13200.0	1A01A.2	YG	208.00	300.00	300.00
	Pos. Seq. Z%:	1.27 + J 5.25	(Zpu	4.22 + j 17.50)	Shell Type			
	Zero Seq. Z%:	1.27 + J 5.25	(Sec	4.22 + j 17.50	Pri Open)			
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leading Sec.):	30.00 Deg.				
LEE 480	1A.01A.1	D	13200.0	1A01A.1	YG	480.00	500.00	500.00
	Pos. Seq. Z%:	1.13 + J 5.29	(Zpu	2.25 + j 10.58)	Shell Type			
	Zero Seq. Z%:	1.13 + J 5.29	(Sec	2.25 + j 10.58	Pri Open)			
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leading Sec.):	30.00 Deg.				
LP XFMR	4B.04.1	D	13200.0	4B04.1	YG	208.00	300.00	300.00
	Pos. Seq. Z%:	1.15 + J 5.19	(Zpu	3.85 + j 17.31)	Shell Type			
	Zero Seq. Z%:	1.15 + J 5.19	(Sec	3.85 + j 17.31	Pri Open)			
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leading Sec.):	30.00 Deg.				
MACKIN XFMR	2C.02.1	D	13200.0	2C02.1	YG	208.00	300.00	300.00
	Pos. Seq. Z%:	1.28 + J 5.32	(Zpu	4.27 + j 17.73)	Shell Type			
	Zero Seq. Z%:	1.28 + J 5.32	(Sec	4.27 + j 17.73	Pri Open)			
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leading Sec.):	30.00 Deg.				
MAHAR XFMR	3B.04.1	D	13200.0	3B04.1	YG	208.00	750.00	750.00
	Pos. Seq. Z%:	1.04 + J 5.22	(Zpu	1.39 + j 6.96)	Shell Type			
	Zero Seq. Z%:	1.04 + J 5.22	(Sec	1.39 + j 6.96	Pri Open)			
	Taps Pri. 0.000 %	Sec. 0.000 %	Phase Shift (Pri. Leading Sec.):	30.00 Deg.				

TRANSFORMER INPUT DATA

TRANSFORMER NAME	PRIMARY RECORD NO	NAME	VOLTS L-L	* SECONDARY RECORD NO	NAME	VOLTS L-L	FULL-LOAD KVA	NOMINAL KVA
ONEIDA XFMR	4B.02.1	D	13200.0	4B02.1		YG 208.00	300.00	300.00
	Pos. Seq. Z%:		1.15 + J 5.19	(Zpu	3.85 + j 17.31)		Shell Type	
	Zero Seq. Z%:		1.15 + J 5.19	(Sec	3.85 + j 17.31	Pri	Open)	
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
ONON XFMR	4B.01.1	D	13200.0	4B01.1		YG 208.00	750.00	750.00
	Pos. Seq. Z%:		1.04 + J 5.22	(Zpu	1.39 + j 6.96)		Shell Type	
	Zero Seq. Z%:		1.04 + J 5.22	(Sec	1.39 + j 6.96	Pri	Open)	
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
PARK XFMR	2C.04.1	D	13200.0	2C04.1		YG 208.00	750.00	750.00
	Pos. Seq. Z%:		1.11 + J 5.82	(Zpu	1.48 + j 7.77)		Shell Type	
	Zero Seq. Z%:		1.11 + J 5.82	(Sec	1.48 + j 7.77	Pri	Open)	
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
PATH XFMR	4C.04.1	D	13200.0	4C04.1		YG 208.00	300.00	300.00
	Pos. Seq. Z%:		1.15 + J 5.19	(Zpu	3.85 + j 17.31)		Shell Type	
	Zero Seq. Z%:		1.15 + J 5.19	(Sec	3.85 + j 17.31	Pri	Open)	
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
PEN XFMR	3B.02.1	D	13200.0	3B02.1		YG 480.00	2667.00	2000.00
	Pos. Seq. Z%:		0.659 + J 5.28	(Zpu	0.330 + j 2.64)		Shell Type	
	Zero Seq. Z%:		0.659 + J 5.28	(Sec	0.330 + j 2.64	Pri	Open)	
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
PIEZ 1 XFMR	5C.01.1	D	13200.0	5C01.1		YG 480.00	2000.00	1500.00
	Pos. Seq. Z%:		0.854 + J 5.59	(Zpu	0.569 + j 3.72)		Shell Type	
	Zero Seq. Z%:		0.854 + J 5.59	(Sec	0.569 + j 3.72	Pri	Open)	
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							

TRANSFORMER INPUT DATA

TRANSFORMER NAME	PRIMARY RECORD NO	NAME	VOLTS L-L	* SECONDARY RECORD NO	NAME	VOLTS L-L	FULL-LOAD KVA	NOMINAL KVA
PIEZ 2 XFMR	5C.01.2	D	13200.0	5C01.2		YG 480.00	3333.00	2500.00
	Pos. Seq. Z%:	0.541 + J 5.67	(Zpu 0.216 + j 2.27)	Shell Type				
	Zero Seq. Z%:	0.541 + J 5.67	(Sec 0.216 + j 2.27 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
RICH 1 XFMR	2C.03.2	D	13200.0	2C03.2		YG 208.00	300.00	300.00
	Pos. Seq. Z%:	1.27 + J 5.29	(Zpu 4.25 + j 17.63)	Shell Type				
	Zero Seq. Z%:	1.27 + J 5.29	(Sec 4.25 + j 17.63 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
RICH 2 XFMR	2C.03.1	D	13200.0	2C03.1		YG 480.00	500.00	500.00
	Pos. Seq. Z%:	1.15 + J 5.40	(Zpu 2.30 + j 10.80)	Shell Type				
	Zero Seq. Z%:	1.15 + J 5.40	(Sec 2.30 + j 10.80 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
RIGGS XFMR	1A.02.1	D	13200.0	1A02.1		YG 208.00	677.00	500.00
	Pos. Seq. Z%:	1.24 + J 5.83	(Zpu 2.48 + j 11.66)	Shell Type				
	Zero Seq. Z%:	1.24 + J 5.83	(Sec 2.48 + j 11.66 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
SCALES XFMR	1B.02.1	D	13200.0	1B02.1		YG 208.00	225.00	225.00
	Pos. Seq. Z%:	1.41 + J 5.50	(Zpu 6.28 + j 24.45)	Shell Type				
	Zero Seq. Z%:	1.41 + J 5.50	(Sec 6.28 + j 24.45 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
SEN XFMR	4C.03.1	D	13200.0	4C03.1		YG 208.00	750.00	750.00
	Pos. Seq. Z%:	1.04 + J 5.22	(Zpu 1.39 + j 6.96)	Shell Type				
	Zero Seq. Z%:	1.04 + J 5.22	(Sec 1.39 + j 6.96 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							

TRANSFORMER INPUT DATA

TRANSFORMER NAME	PRIMARY RECORD NO	NAME	VOLTS L-L	* SECONDARY RECORD NO	NAME	VOLTS L-L	FULL-LOAD KVA	NOMINAL KVA
SERV XFMR	2C.01.1	D	13200.0	2C01.1		YG	208.00	112.50	112.50
	Pos. Seq. Z%:		1.48 + J 5.04	(Zpu	13.19 + j 44.76)		Shell Type	
	Zero Seq. Z%:		1.48 + J 5.04	(Sec	13.19 + j 44.76 Pri		Open)	
	Taps Pri. 0.000 %		Sec. 0.000 %	Phase Shift (Pri. Leading Sec.):			30.00 Deg.	
SNYGG XFMR	2A.02.1	D	13200.0	2A02.1		YG	208.00	1000.00	1000.00
	Pos. Seq. Z%:		0.991 + J 5.66	(Zpu	0.991 + j 5.66)		Shell Type	
	Zero Seq. Z%:		0.991 + J 5.66	(Sec	0.991 + j 5.66 Pri		Open)	
	Taps Pri. 0.000 %		Sec. 0.000 %	Phase Shift (Pri. Leading Sec.):			30.00 Deg.	
T1	0.01	D	34500.0	0.1		YG	13200.0	6250.00	5000.00
	Pos. Seq. Z%:		0.492 + J 7.38	(Zpu	0.098 + j 1.48)		Shell Type	
	Zero Seq. Z%:		0.492 + J 7.38	(Sec	32.81 + j 1.48 Pri		Open)	
	Taps Pri. 0.000 %		Sec. 0.000 %	Phase Shift (Pri. Leading Sec.):			0.000 Deg.	
Secondary Neutral Z:	19.00 + J 0.000 Ohms							
T2	0.02	D	34500.0	0.2		YG	13200.0	6250.00	5000.00
	Pos. Seq. Z%:		0.492 + J 7.38	(Zpu	0.098 + j 1.48)		Shell Type	
	Zero Seq. Z%:		0.492 + J 7.38	(Sec	32.81 + j 1.48 Pri		Open)	
	Taps Pri. 0.000 %		Sec. 0.000 %	Phase Shift (Pri. Leading Sec.):			0.000 Deg.	
Secondary Neutral Z:	19.00 + J 0.000 Ohms							
T3	0.03	D	34500.0	0.3		YG	13200.0	10500.0	7500.00
	Pos. Seq. Z%:		0.503 + J 7.44	(Zpu	0.067 + j 0.992)		Shell Type	
	Zero Seq. Z%:		0.503 + J 7.44	(Sec	32.87 + j 0.992 Pri		Open)	
	Taps Pri. 0.000 %		Sec. 0.000 %	Phase Shift (Pri. Leading Sec.):			0.000 Deg.	
Secondary Neutral Z:	19.05 + J 0.000 Ohms							

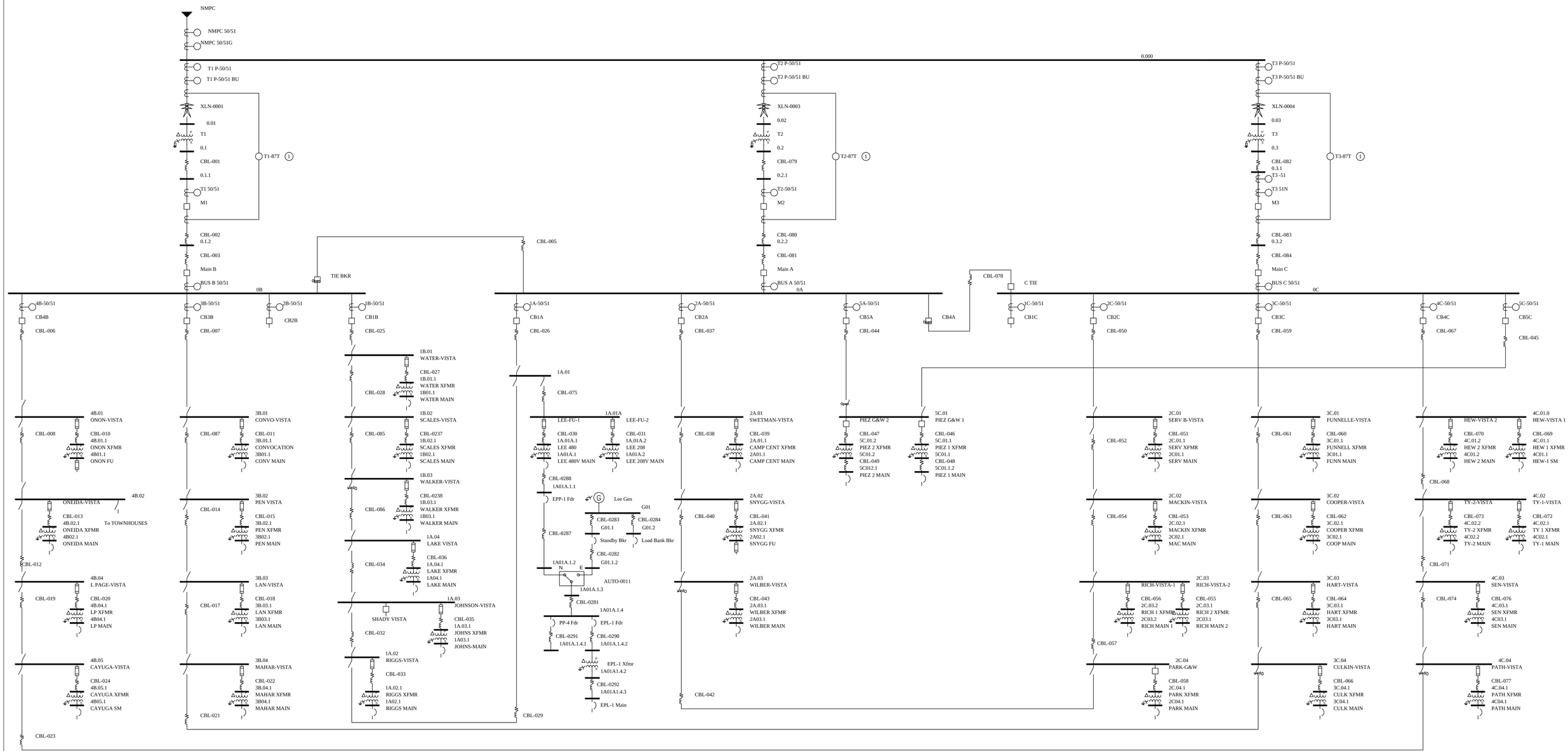
TRANSFORMER INPUT DATA

TRANSFORMER NAME	PRIMARY RECORD NO	NAME	VOLTS L-L	* SECONDARY RECORD NO	NAME	VOLTS L-L	FULL-LOAD KVA	NOMINAL KVA
TY 1 XFMR	4C.02.1	D	13200.0	4C02.1	YG	208.00	1000.00	1000.00
	Pos. Seq. Z%:	0.874 + J 5.25	(Zpu 0.874 + j 5.25)	Shell Type				
	Zero Seq. Z%:	0.874 + J 5.25	(Sec 0.874 + j 5.25 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
TY-2 XFMR	4C.02.2	D	13200.0	4C02.2	YG	480.00	225.00	225.00
	Pos. Seq. Z%:	1.22 + J 5.18	(Zpu 5.42 + j 23.02)	Shell Type				
	Zero Seq. Z%:	1.22 + J 5.18	(Sec 5.42 + j 23.02 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
WALKER XFMR	1B.03.1	D	13200.0	1B03.1	YG	208.00	225.00	225.00
	Pos. Seq. Z%:	1.41 + J 5.49	(Zpu 6.27 + j 24.41)	Shell Type				
	Zero Seq. Z%:	1.41 + J 5.49	(Sec 6.27 + j 24.41 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
WATER XFMR	1B.01.1	D	13200.0	1B01.1	YG	208.00	225.00	225.00
	Pos. Seq. Z%:	1.42 + J 5.52	(Zpu 6.30 + j 24.54)	Shell Type				
	Zero Seq. Z%:	1.42 + J 5.52	(Sec 6.30 + j 24.54 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							
WILBER XFMR	2A.03.1	D	13200.0	2A03.1	YG	208.00	750.00	750.00
	Pos. Seq. Z%:	1.09 + J 5.72	(Zpu 1.45 + j 7.62)	Shell Type				
	Zero Seq. Z%:	1.09 + J 5.72	(Sec 1.45 + j 7.62 Pri Open)					
	Taps Pri. 0.000 % Sec. 0.000 % Phase Shift (Pri. Leading Sec.): 30.00 Deg.							

GENERATION CONTRIBUTION DATA

BUS NAME	CONTRIBUTION NAME	VOLTAGE L-L	MVA	X"d	X/R
0.000	NMPC	34500.0	376.64		
	Three Phase	Contribution:	6303.00 AMPS		7.18
	Single Line to Ground	Contribution:	6204.00 AMPS		7.72
	Pos Sequence Impedance (100 MVA Base)		0.0366 + J	0.2630 PU	
	Zero Sequence Impedance (100 MVA Base)		0.0307 + J	0.2766 PU	
G01	Lee Gen	480.00	0.500	0.1500	20.00
	KG: 0.9174	xdsat:	1.60	Excitation Limit:	1.30 Ik - ON
	Pos Sequence Impedance (100 MVA Base)		1.50 + J	30.00 PU	

8.0 PDC STUDY MODEL (One Line Diagram)



NOTE:

1. NOT INCLUDED IN MODEL, ADDED FOR REFERENCE PER CONSULTANTS REQUEST

NO.	DATE	BY	APP'D.	REVISION

SUNY OSWEGO
POWER SYSTEM STUDY
MODEL ONE LINE

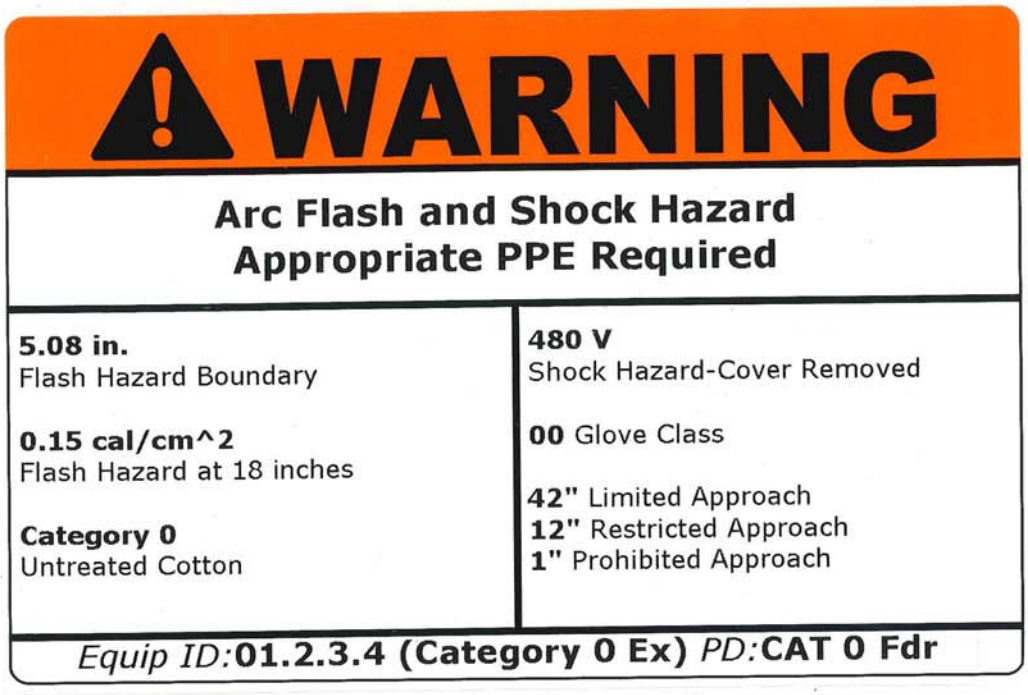
6268 Route 31
Cicero, NY 13039
Phone: (315)699-5563

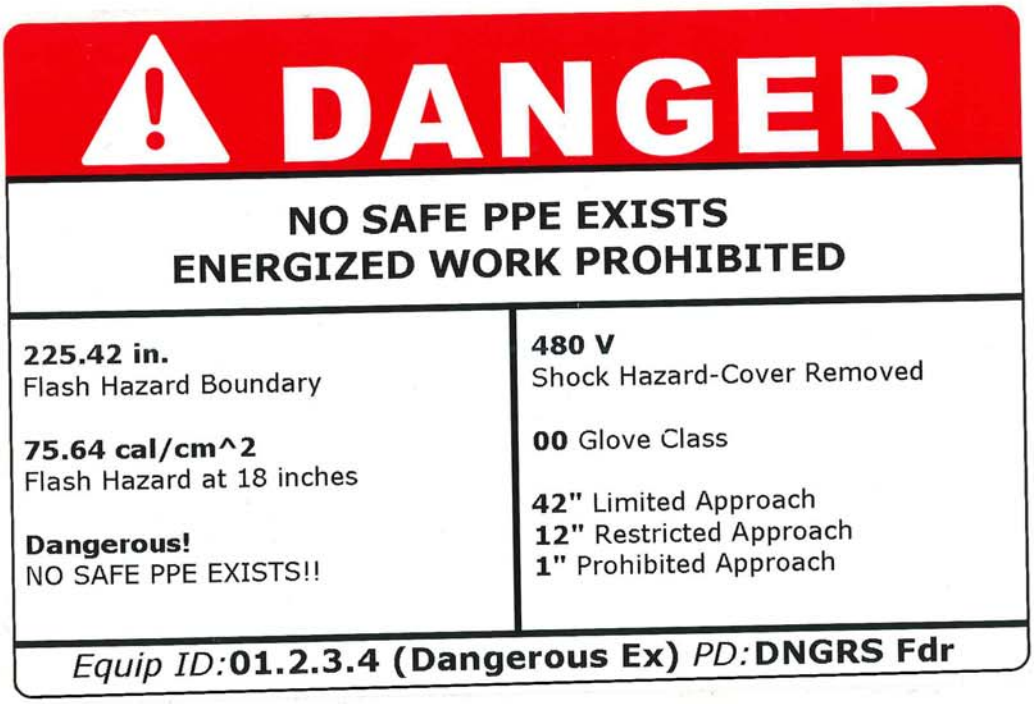
HMT, Inc.
High Voltage Maintenance & Technical Services

P.O. Box 1957
Cicero, NY 13039
Fax: (315)699-5911

DATE: 6-21-13 | DRAWN BY: MW | DRAWING NUMBER
SCALE: | APP'D BY: RP | 13153-E1
SHEET NO. 1 OF 1 | JOB NO. 13153

9.0 EXAMPLE ARC FLASH LABELS


WARNING
Arc Flash and Shock Hazard
Appropriate PPE Required
5.08 in.
Flash Hazard Boundary
0.15 cal/cm^2
Flash Hazard at 18 inches
Category 0
Untreated Cotton
480 V
Shock Hazard-Cover Removed
00 Glove Class
42" Limited Approach
12" Restricted Approach
1" Prohibited Approach
Equip ID:01.2.3.4 (Category 0 Ex) PD:CAT 0 Fdr


DANGER
NO SAFE PPE EXISTS
ENERGIZED WORK PROHIBITED
225.42 in.
Flash Hazard Boundary
75.64 cal/cm^2
Flash Hazard at 18 inches
Dangerous!
NO SAFE PPE EXISTS!!
480 V
Shock Hazard-Cover Removed
00 Glove Class
42" Limited Approach
12" Restricted Approach
1" Prohibited Approach
Equip ID:01.2.3.4 (Dangerous Ex) PD:DNGRS Fdr

SUNY OSWEGO
POWER SYSTEM STUDY