

250 kW Solar Generation Connection to T4 (F8) Lorne St. - CIA Sample Analysis

Transmission Line Voltage		115 kV	
Node Studied		464	
Season	Generation/Load	Min Load	Max Load
Summer	No Generation	97.60%	98.30%
	Full Generation	98.40%	99.10%
Non-Summer	No Generation	96.90%	97.20%
	Full Generation	96.90%	98.10%
Generation Capacity (kW)		250	

- The Feeder steady-State voltage at PCC is within +/- 6% range of the nominal voltage (0.94 p.u to 1.06 p.u) at min/max feeder load
- The Feeder momentary voltage fluctuation is within +/- 4% voltage change which is acceptable up sudden tripping

Line Loading

July-18-13 9:46:58 AM

See below for more info. on node ID of 464

[Line Details](#)

[Loss Summary](#)

Analysis Properties

Minimum
Iterations 3

Maximum
Iterations 50

Voltage 0.0001
Tolerance p.u.

Iterations 6
Scaling 1
Hour 8

2:
Week Weekday

3:
Season Summer

Temperat
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Mismatch
Node 446

Mismatch 0.000 kW

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System
File example.
dss.xml

Line Details (by ID)

			Phase R	Phase W	Phase B
			104.55 kW	94.28 kW	116.1 kW
Line:	3	Flow:	129.24 kVAr	121.74 kVAr	137.07 kVAr
			0.01 kW 0.02	0.01 kW 0.02	0.02 kW 0.03
1st Node:	9 (F81-X)	Losses:	kVAr	kVAr	kVAr
2nd					
Node:	5	Current:	69.438 A	64.234 A	74.984 A
			Loading:	16.45%	15.22%
				17.77%	
			104.35 kW 128.9	94.08 kW	115.81 kW
Line:	6	Flow:	kVAr	121.49 kVAr	136.65 kVAr
			0.19 kW 0.35	0.21 kW 0.27	0.29 kW 0.44
1st Node:	5	Losses:	kVAr	kVAr	kVAr
2nd					
Node:	11 (TAP)	Current:	69.442 A	64.237 A	74.987 A
			Loading:	16.46%	15.22%
				17.77%	
			58.82 kW 102.32	48.44 kW	70.24 kW
Line:	9	Flow:	kVAr	94.78 kVAr	110.03 kVAr
			0.03 kW 0.07	0.04 kW 0.05	0.06 kW 0.09
1st Node:	11 (TAP)	Losses:	kVAr	kVAr	kVAr
2nd					
Node:	12 (TAP)	Current:	49.448 A	44.525 A	54.693 A
			Loading:	11.72%	10.55%
				12.96%	
			54.9 kW 99.27	47.44 kW 94	69.87 kW
Line:	14	Flow:	kVAr	kVAr	109.52 kVAr
			0.01 kW 0.02	0.01 kW 0.02	0.02 kW 0.03
1st Node:	16 (137)	Losses:	kVAr	kVAr	kVAr

2nd

Node:	17 (138)	Current:	47.713 A	44.197 A	54.712 A
		Loading:	11.31%	10.47%	12.96%
			54.89 kW 99.24	43.71 kW	69.84 kW
Line:	15	Flow:	kVAr	91.28 kVAr	109.48 kVAr
			0.01 kW 0.03	0.02 kW 0.02	0.03 kW 0.04
1st Node:	17 (138)	Losses:	kVAr	kVAr	kVAr

2nd

Node:	18 (139)	Current:	47.714 A	42.489 A	54.713 A
		Loading:	11.31%	10.07%	12.97%
			54.8 kW 99.21	40.88 kW	69.71 kW
Line:	16	Flow:	kVAr	89.25 kVAr	109.43 kVAr
			0.09 kW 0.03	0.08 kW 0.02	0.13 kW 0.05
1st Node:	18 (139)	Losses:	kVAr	kVAr	kVAr

2nd

Node:	19 (140)	Current:	47.715 A	41.235 A	54.714 A
		Loading:	38.17%	32.99%	43.77%
			42.1 kW 89.17	24.42 kW	57.01 kW 99.4
Line:	19	Flow:	kVAr	76.48 kVAr	kVAr
			0.02 kW 0.04	0.03 kW 0.02	0.05 kW 0.07
1st Node:	19 (140)	Losses:	kVAr	kVAr	kVAr

2nd

Node:	22 (141)	Current:	41.535 A	33.735 A	48.358 A
		Loading:	9.84%	7.99%	11.46%
			40.22 kW 87.78	24.39 kW	56.95 kW
Line:	20	Flow:	kVAr	76.45 kVAr	99.32 kVAr
			0.02 kW 0.05	0.03 kW 0.03	0.06 kW 0.09
1st Node:	22 (141)	Losses:	kVAr	kVAr	kVAr

2nd

Node:	23 (335)	Current:	40.691 A	33.737 A	48.361 A
		Loading:	9.64%	7.99%	11.46%
			36.3 kW 84.41	20.44 kW	53.01 kW
Line:	21	Flow:	kVAr	73.08 kVAr	95.95 kVAr
			0.01 kW 0.03	0.02 kW 0.01	0.03 kW 0.05
1st Node:	23 (335)	Losses:	kVAr	kVAr	kVAr

2nd

Node:	24	Current:	38.734 A	31.91 A	46.328 A
		Loading:	9.18%	7.56%	10.98%
			27.05 kW 77.72	20.42 kW	49.29 kW
Line:	28	Flow:	kVAr	73.07 kVAr	93.22 kVAr
			0.01 kW 0.02	0.02 kW 0.02	0.03 kW 0.06
1st Node:	24	Losses:	kVAr	kVAr	kVAr

2nd

Node:	31	Current:	34.703 A	31.912 A	44.593 A
		Loading:	8.22%	7.56%	10.57%
			-24.66 kW 45.73	-24.06 kW	-5.85 kW
Line:	35	Flow:	kVAr	46.21 kVAr	59.02 kVAr

1st Node:	31	Losses:	0.01 kW 0.01 kVAr	0.01 kW 0.01 kVAr	0.01 kW 0.01 kVAr
2nd Node:	38	Current:	-21.912 A	-21.916 A	-25.085 A
		Loading:	5.19%	5.19%	5.94%
Line:	37	Flow:	-32.49 kW 39.08 kVAr	-38.6 kW 34.65 kVAr	-16.6 kW 50.26 kVAr
1st Node:	38	Losses:	0 kW 0 kVAr	0 kW 0 kVAr	0 kW 0 kVAr
2nd Node:	40 (330)	Current:	-21.433 A	-21.819 A	-22.391 A
		Loading:	5.08%	5.17%	5.31%
Line:	38	Flow:	-34.48 kW 37.34 kVAr	-40.59 kW 32.89 kVAr	-18.58 kW 48.53 kVAr
1st Node:	40 (330)	Losses:	0.01 kW 0.01 kVAr	0.01 kW 0.01 kVAr	0.01 kW 0.02 kVAr
2nd Node:	41 (191)	Current:	-21.435 A	-21.98 A	-21.987 A
		Loading:	5.08%	5.21%	5.21%
Line:	39	Flow:	-38.19 kW 34.66 kVAr	-40.61 kW 32.88 kVAr	-18.59 kW 48.52 kVAr
1st Node:	41 (191)	Losses:	0.02 kW 0.01 kVAr	0.02 kW 0.02 kVAr	0.01 kW 0.02 kVAr
2nd Node:	42 (S34)	Current:	-21.747 A	-21.981 A	-21.99 A
		Loading:	7.97%	8.05%	8.05%
Line:	40	Flow:	-38.19 kW 34.66 kVAr	-40.61 kW 32.88 kVAr	-18.59 kW 48.52 kVAr
1st Node:	42 (S34)	Losses:	0 kW 0 kVAr	0 kW 0 kVAr	0 kW 0 kVAr
2nd Node:	43	Current:	-21.748 A	-21.982 A	-21.991 A
		Loading:	5.15%	5.21%	5.21%
Line:	59	Flow:	-75.36 kW 7.37 kVAr	-66.05 kW 13.96 kVAr	-54.63 kW 22.07 kVAr
1st Node:	43	Losses:	0.01 kW 0 kVAr	0 kW 0 kVAr	0 kW 0 kVAr
2nd Node:	59 (S34)	Current:	-31.926 A	-28.397 A	-24.938 A
		Loading:	18.78%	16.70%	14.67%
Line:	60	Flow:	-75.38 kW 7.36 kVAr	-66.06 kW 13.95 kVAr	-54.64 kW 22.06 kVAr
1st Node:	59 (S34)	Losses:	0.02 kW 0.01 kVAr	0.01 kW 0.01 kVAr	0.01 kW 0 kVAr
2nd Node:	60 (194)	Current:	-31.926 A	-28.397 A	-24.938 A
		Loading:	18.78%	16.70%	14.67%

Line:	61	Flow:	-75.39 kW 7.35 kVAr	-66.07 kW 13.95 kVAr	-58.33 kW 19.4 kVAr
1st Node:	60 (194)	Losses:	0.02 kW 0.01 kVAr	0.01 kW 0.01 kVAr	0.01 kW 0 kVAr
2nd Node:	61 (334-1)	Current:	-31.926 A	-28.397 A	-26.012 A
		Loading:	18.78%	16.70%	15.30%
Line:	62	Flow:	-75.39 kW 7.35 kVAr	-67.19 kW 13.13 kVAr	-58.33 kW 19.41 kVAr
1st Node:	61 (334-1)	Losses:	0 kW 0 kVAr	0 kW 0 kVAr	0 kW 0 kVAr
2nd Node:	62 (334)	Current:	-31.926 A	-28.789 A	-26.012 A
		Loading:	18.78%	16.93%	15.30%
Line:	63	Flow:	-75.41 kW 7.34 kVAr	-67.2 kW 13.12 kVAr	-59.44 kW 18.6 kVAr
1st Node:	62 (334)	Losses:	0.02 kW 0.01 kVAr	0.01 kW 0.01 kVAr	0.01 kW 0.01 kVAr
2nd Node:	63 (195)	Current:	-31.926 A	-28.789 A	-26.353 A
		Loading:	18.78%	16.93%	15.50%
Line:	64	Flow:	-75.43 kW 7.33 kVAr	-67.21 kW 13.11 kVAr	-63.13 kW 15.93 kVAr
1st Node:	63 (195)	Losses:	0.02 kW 0.01 kVAr	0.01 kW 0.01 kVAr	0.01 kW 0.01 kVAr
2nd Node:	64 (325)	Current:	-31.926 A	-28.789 A	-27.547 A
		Loading:	18.78%	16.93%	16.20%
Line:	65	Flow:	-77.46 kW 5.57 kVAr	-69.23 kW 11.34 kVAr	-65.13 kW 14.2 kVAr
1st Node:	64 (325)	Losses:	0.05 kW 0.03 kVAr	0.03 kW 0.03 kVAr	0.03 kW 0.02 kVAr
2nd Node:	65 (196)	Current:	-32.696 A	-29.482 A	-28.192 A
		Loading:	19.23%	17.34%	16.58%
Line:	66	Flow:	-77.48 kW 5.56 kVAr	-69.24 kW 11.33 kVAr	-70.66 kW 10.22 kVAr
1st Node:	65 (196)	Losses:	0.02 kW 0.02 kVAr	0.02 kW 0.01 kVAr	0.02 kW 0.01 kVAr
2nd Node:	66	Current:	-32.696 A	-29.482 A	-30.189 A
		Loading:	19.23%	17.34%	17.76%
Line:	200	Flow:	58.62 kW 101.97 kVAr	47.46 kW 94 kVAr	69.89 kW 109.53 kVAr
1st Node:	12 (TAP)	Losses:	0.19 kW 0.39 kVAr	0.23 kW 0.26 kVAr	0.35 kW 0.53 kVAr

2nd					
Node:	16 (137)	Current:	49.461 A	44.19 A	54.705 A
		Loading:	11.72%	10.47%	12.96%
			104.56 kW	94.3 kW	116.12 kW
Line:	460	Flow:	129.26 kVAr	121.76 kVAr	137.1 kVAr
1st Node:	432	Losses:	0 kW 0 kVAr	0 kW 0 kVAr	0 kW 0 kVAr
2nd					
Node:	9 (F81-X)	Current:	69.438 A	64.234 A	74.984 A
		Loading:	6.94%	6.42%	7.50%
			237.19 kW	213.12 kW	244.29 kW
Line:	519	Flow:	143.51 kVAr	127.38 kVAr	148.78 kVAr
1st Node:	430	Losses:	0 kW 0 kVAr	0 kW 0 kVAr	0 kW 0 kVAr
2nd					
Node:	462	Current:	116.938 A	104.592 A	120.565 A
		Loading:	11.69%	10.46%	12.06%
			237.19 kW	213.12 kW	244.29 kW
Line:	520	Flow:	143.51 kVAr	127.38 kVAr	148.78 kVAr
1st Node:	472	Losses:	0 kW 0 kVAr	0 kW 0 kVAr	0 kW 0 kVAr
2nd					
Node:	432	Current:	115.781 A	103.556 A	119.371 A
		Loading:	11.58%	10.36%	11.94%
			-80.46 kW 2.99	-72.22 kW	-73.62 kW
Line:	538	Flow:	kVAr	8.76 kVAr	7.69 kVAr
			0.03 kW 0.02	0.02 kW 0.02	0.02 kW 0.01
1st Node:	66	Losses:	kVAr	kVAr	kVAr
2nd					
Node:	464	Current:	-33.876 A	-30.558 A	-31.286 A
		Loading:	19.93%	17.98%	18.40%
			-83.22 kW 1	-83.35 kW 0.7	-82.83 kW
Line:	540	Flow:	kVAr	kVAr	1.05 kVAr
			0.01 kW 0.01	0.01 kW 0.01	0.01 kW 0.01
1st Node:	464	Losses:	kVAr	kVAr	kVAr
2nd					
Node:	465	Current:	-35.01 A	-35.01 A	-35.009 A
		Loading:	20.59%	20.59%	20.59%

[Top](#)

Line Loss Summary

Lines in report:	29
Total Length:	1,468.4 m
Total Line Losses:	2.94 kW 3.73 kVAr

[Top](#)

Line Loading

July-18-13 9:49:50 AM

See below for more info. on node ID of 464

[Line Details](#)

[Loss Summary](#)

Analysis Properties

Minimum
Iterations 3

Maximum
Iterations 50

Voltage 0.0001
Tolerance p.u.

Iterations 8
Scaling 1
Hour 8

2:
Week Weekday
Season 5: Winter
Temperat
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Mismatch
Node 310

Mismatch 0.003 kW

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Line Details (by ID)

		Phase R	Phase W	Phase B
		222.23 kW 204.5	200.37 kW 189.03	247.76 kW 220.15
Line:	3 Flow:	kVAr	kVAr	kVAr
1st Node:	9 (F81-X)	Losses:	0.04 kW 0.08 kVAr	0.04 kW 0.05 kVAr
2nd				0.07 kW 0.1 kVAr
Node:	5 Current:	126.312 A	114.919 A	138.374 A
	Loading:	29.93%	27.23%	32.79%
		221.61 kW 203.32	199.71 kW 188.21	246.75 kW 218.67
Line:	6 Flow:	kVAr	kVAr	kVAr
1st Node:	5 Losses:	0.62 kW 1.19 kVAr	0.66 kW 0.83 kVAr	1.02 kW 1.49 kVAr
2nd				
Node:	11 (TAP) Current:	126.315 A	114.922 A	138.377 A
	Loading:	29.93%	27.23%	32.79%
		171.7 kW 174.35	149.59 kW 159.05	196.67 kW 189.53
Line:	9 Flow:	kVAr	kVAr	kVAr
1st Node:	11 (TAP) Losses:	0.15 kW 0.3 kVAr	0.16 kW 0.19 kVAr	0.27 kW 0.4 kVAr
2nd				
Node:	12 (TAP) Current:	102.909 A	91.543 A	114.833 A
	Loading:	24.39%	21.69%	27.21%
		162.68 kW 167.1	146.96 kW 156.82	195.01 kW 187.15
Line:	14 Flow:	kVAr	kVAr	kVAr
1st Node:	16 (137) Losses:	0.05 kW 0.1 kVAr	0.06 kW 0.07 kVAr	0.09 kW 0.14 kVAr

2nd									
Node:	17 (138)	Current:	98.855 A		90.741 A		114.849 A		
		Loading:		23.43%		21.50%		27.22%	
			162.62 kW	166.97	138.72 kW	151.22	194.88 kW	186.96	
Line:	15	Flow:	kVAr		kVAr		kVAr		
1st Node: 17 (138) Losses: 0.06 kW 0.13 kVAr 0.07 kW 0.08 kVAr 0.13 kW 0.19 kVAr									
2nd									
Node:	18 (139)	Current:	98.855 A		86.686 A		114.85 A		
		Loading:		23.43%		20.54%		27.22%	
			162.24 kW	166.82	132.36 kW	147.05	194.28 kW	186.74	
Line:	16	Flow:	kVAr		kVAr		kVAr		
1st Node: 18 (139) Losses: 0.39 kW 0.15 kVAr 0.32 kW 0.08 kVAr 0.6 kW 0.23 kVAr									
2nd									
Node:	19 (140)	Current:	98.856 A		83.69 A		114.851 A		
		Loading:		79.08%		66.95%		91.88%	
			134.83 kW	147.34	96.65 kW	121.98	166.85 kW	167.29	
Line:	19	Flow:	kVAr		kVAr		kVAr		
1st Node: 19 (140) Losses: 0.07 kW 0.2 kVAr 0.09 kW 0.07 kVAr 0.21 kW 0.3 kVAr									
2nd									
Node:	22 (141)	Current:	84.926 A		65.879 A		100.856 A		
		Loading:		20.12%		15.61%		23.90%	
			130.7 kW	144.39	96.54 kW	121.89	166.58 kW	166.92	
Line:	20	Flow:	kVAr		kVAr		kVAr		
1st Node: 22 (141) Losses: 0.08 kW 0.23 kVAr 0.11 kW 0.09 kVAr 0.27 kW 0.38 kVAr									
2nd									
Node:	23 (335)	Current:	82.911 A		65.881 A		100.858 A		
		Loading:		19.65%		15.61%		23.90%	
			122.36 kW	138.18	88.14 kW	115.7	158.19 kW	160.7	
Line:	21	Flow:	kVAr		kVAr		kVAr		
1st Node: 23 (335) Losses: 0.04 kW 0.12 kVAr 0.06 kW 0.05 kVAr 0.14 kW 0.21 kVAr									
2nd									
Node:	24	Current:	78.627 A		61.654 A		96.549 A		
		Loading:		18.63%		14.61%		22.88%	
			102.15 kW	124.58	88.06 kW	115.64	150.01 kW	155.11	
Line:	28	Flow:	kVAr		kVAr		kVAr		
1st Node: 24 Losses: 0.04 kW 0.1 kVAr 0.08 kW 0.07 kVAr 0.15 kW 0.24 kVAr									
2nd									
Node:	31	Current:	68.673 A		61.655 A		92.507 A		
		Loading:		16.27%		14.61%		21.92%	
			42.77 kW	87.66	44.52 kW	89.11	83.1 kW	113.53	
Line:	35	Flow:	kVAr		kVAr		kVAr		

1st Node:	31	Losses:	0.01 kW 0.02 kVAr	0.03 kW 0.03 kVAr	0.04 kW 0.08 kVAr
2nd					
Node:	38	Current:	41.588 A	42.272 A	60.358 A
		Loading:	9.86%	10.02%	14.30%
			26.21 kW 75.55	13.23 kW 67.03	
Line:	37	Flow:	kVAr	kVAr	60.23 kW 97.3 kVAr
1st Node:	38	Losses:	0 kW 0.01 kVAr	0.01 kW 0.01 kVAr	0.03 kW 0.05 kVAr
2nd					
Node:	40 (330)	Current:	34.102 A	28.999 A	49.114 A
		Loading:	8.08%	6.87%	11.64%
			22.05 kW 72.45		56.07 kW 94.19
Line:	38	Flow:	kVAr	9.03 kW 63.9 kVAr	kVAr
1st Node:	40 (330)	Losses:	0.01 kW 0.02 kVAr	0.02 kW 0.01 kVAr	0.04 kW 0.08 kVAr
2nd					
Node:	41 (191)	Current:	32.303 A	27.397 A	47.082 A
		Loading:	7.65%	6.49%	11.16%
			13.97 kW 67.05	8.99 kW 63.89	
Line:	39	Flow:	kVAr	kVAr	56 kW 94.12 kVAr
1st Node:	41 (191)	Losses:	0.02 kW 0.01 kVAr	0.04 kW 0.02 kVAr	0.07 kW 0.08 kVAr
2nd					
Node:	42 (S34)	Current:	29.221 A	27.399 A	47.084 A
		Loading:	10.70%	10.04%	17.25%
			13.97 kW 67.05	8.99 kW 63.89	55.99 kW 94.11
Line:	40	Flow:	kVAr	kVAr	kVAr
1st Node:	42 (S34)	Losses:	0 kW 0 kVAr	0 kW 0 kVAr	0.01 kW 0.01 kVAr
2nd					
Node:	43	Current:	29.222 A	27.4 A	47.085 A
		Loading:	6.92%	6.49%	11.16%
			-66.77 kW 12.89	-46.31 kW 26.22	-21.92 kW 42.09
Line:	59	Flow:	kVAr	kVAr	kVAr
1st Node:	43	Losses:	0.01 kW 0 kVAr	0 kW 0 kVAr	0 kW 0 kVAr
2nd					
Node:	59 (S34)	Current:	-29.013 A	-22.603 A	-20.403 A
		Loading:	17.07%	13.30%	12%
			-66.79 kW 12.89	-46.32 kW 26.21	-21.92 kW 42.08
Line:	60	Flow:	kVAr	kVAr	kVAr
1st Node:	59 (S34)	Losses:	0.02 kW 0.01 kVAr	0.01 kW 0.01 kVAr	0 kW 0 kVAr
2nd					
Node:	60 (194)	Current:	-29.013 A	-22.603 A	-20.404 A
		Loading:	17.07%	13.30%	12%

Line:	61	Flow:	-66.81 kW 12.88 kVAr	-46.33 kW 26.2 kVAr	-29.9 kW 36.79 kVAr
1st Node:	60 (194)	Losses:	0.02 kW 0.01 kVAr	0.01 kW 0.01 kVAr	0 kW 0 kVAr
2nd Node:	61 (334-1)	Current:	-29.013 A	-22.603 A	-20.388 A
		Loading:	17.07%	13.30%	11.99%
Line:	62	Flow:	-66.81 kW 12.88 kVAr	-48.77 kW 24.56 kVAr	-29.9 kW 36.79 kVAr
1st Node:	61 (334-1)	Losses:	0 kW 0 kVAr	0 kW 0 kVAr	0 kW 0 kVAr
2nd Node:	62 (334)	Current:	-29.013 A	-23.188 A	-20.388 A
		Loading:	17.07%	13.64%	11.99%
Line:	63	Flow:	-66.82 kW 12.87 kVAr	-48.77 kW 24.55 kVAr	-32.31 kW 35.2 kVAr
1st Node:	62 (334)	Losses:	0.02 kW 0.01 kVAr	0.01 kW 0.01 kVAr	0 kW 0 kVAr
2nd Node:	63 (195)	Current:	-29.013 A	-23.188 A	-20.545 A
		Loading:	17.07%	13.64%	12.09%
Line:	64	Flow:	-66.84 kW 12.87 kVAr	-48.78 kW 24.55 kVAr	-40.29 kW 29.91 kVAr
1st Node:	63 (195)	Losses:	0.02 kW 0.01 kVAr	0.01 kW 0.01 kVAr	0.01 kW 0 kVAr
2nd Node:	64 (325)	Current:	-29.013 A	-23.188 A	-21.577 A
		Loading:	17.07%	13.64%	12.69%
Line:	65	Flow:	-71.05 kW 9.75 kVAr	-52.98 kW 21.41 kVAr	-44.42 kW 26.88 kVAr
1st Node:	64 (325)	Losses:	0.05 kW 0.03 kVAr	0.02 kW 0.02 kVAr	0.01 kW 0.01 kVAr
2nd Node:	65 (196)	Current:	-30.55 A	-24.261 A	-22.323 A
		Loading:	17.97%	14.27%	13.13%
Line:	66	Flow:	-71.07 kW 9.74 kVAr	-52.99 kW 21.4 kVAr	-56.4 kW 18.95 kVAr
1st Node:	65 (196)	Losses:	0.02 kW 0.02 kVAr	0.01 kW 0.01 kVAr	0.01 kW 0.01 kVAr
2nd Node:	66	Current:	-30.551 A	-24.262 A	-25.577 A
		Loading:	17.97%	14.27%	15.05%
Line:	200	Flow:	170.86 kW 172.66 kVAr	147.02 kW 156.87 kVAr	195.1 kW 187.28 kVAr
1st Node:	12 (TAP)	Losses:	0.84 kW 1.73 kVAr	0.92 kW 1.08 kVAr	1.57 kW 2.29 kVAr

2nd									
Node:	16 (137)	Current:	102.92 A		90.736 A		114.844 A		
		Loading:		24.39%		21.50%		27.21%	
			222.27 kW	204.58	200.42 kW	189.09	247.83 kW	220.25	
Line:	460	Flow:	kVAr		kVAr		kVAr		
1st Node:	432	Losses:	0.01 kW	0.01 kVAr	0.01 kW	0.01 kVAr	0.01 kW	0.01 kVAr	
2nd									
Node:	9 (F81-X)	Current:	126.312 A		114.919 A		138.374 A		
		Loading:		12.63%		11.49%		13.84%	
			424.63 kW	262.92	371.19 kW	228.11	425.99 kW	263.6	
Line:	519	Flow:	kVAr		kVAr		kVAr		
1st Node:	430	Losses:	0 kW	0 kVAr	0 kW	0 kVAr	0 kW	0 kVAr	
2nd									
Node:	462	Current:	212.995 A		185.336 A		213.239 A		
		Loading:		21.30%		18.53%		21.32%	
			424.63 kW	262.92	371.19 kW	228.11	425.99 kW	263.6	
Line:	520	Flow:	kVAr		kVAr		kVAr		
1st Node:	472	Losses:	0 kW	0 kVAr	0 kW	0 kVAr	0 kW	0 kVAr	
2nd									
Node:	432	Current:	208.819 A		181.702 A		209.058 A		
		Loading:		20.88%		18.17%		20.91%	
			-77.31 kW	5.14	-59.24 kW	16.77	-62.55 kW	14.47	
Line:	538	Flow:	kVAr		kVAr		kVAr		
1st Node:	66	Losses:	0.03 kW	0.02 kVAr	0.01 kW	0.01 kVAr	0.02 kW	0.01 kVAr	
2nd									
Node:	464	Current:	-32.984 A		-26.133 A		-27.592 A		
		Loading:		19.40%		15.37%		16.23%	
			-83.31 kW	1.13	-83.56 kW	0.45	-82.52 kW	1.24	
Line:	540	Flow:	kVAr		kVAr		kVAr		
1st Node:	464	Losses:	0.02 kW	0.01 kVAr	0.02 kW	0.01 kVAr	0.02 kW	0.01 kVAr	
2nd									
Node:	465	Current:	-35.462 A		-35.463 A		-35.462 A		
		Loading:		20.86%		20.86%		20.86%	

[Top](#)

Line Loss Summary

Lines in
report: 29
Total
Length: 1,468.4 m

	10.19 kW
Total Line	13.67
Losses:	kVAr

[Top](#)

Short Circuit Fault Currents

July-18-13 9:57:07 AM

[Fault Current Details](#)

[Fault Current Summary](#)

See below for more info. on node ID of 464

Analysis Properties

	C:\Users\NewHP\Desktop\Chapleau Model\Files from CD\FINAL Files- New Analysis\BC - with
System	CAP - CIA
File	example.dss.xml

Fault Currents:

Node ID:	Current	Minimum	Maximum
5	Phase - Ground:	5,986 (-79°) A	6,701 (-79.2°) A
	Phase - Phase:	5,231 (10.8°) A	5,906 (10.6°) A
	Two Phase - Ground:	6,029 (-18.6°) A	6,777 (-18.4°) A
	Three Phase:	6,041 (-79.2°) A	6,819 (-79.4°) A
		43.5 MVA	44.7 MVA

9 (F81-X)	Phase - Ground:	6,124 (-79.6°) A	6,850 (-79.7°) A
	Phase - Phase:	5,303 (10.4°) A	5,983 (10.3°) A
	Two Phase -		
	Ground:	6,124 (-19.6°) A	6,882 (-19.3°) A
	Three Phase:	6,124 (-79.6°) A	6,909 (-79.7°) A
11 (TAP)		44.1 MVA	45.3 MVA
	Phase - Ground:	4,434 (-72.4°) A	5,015 (-74.4°) A
	Phase - Phase:	4,319 (16.1°) A	4,932 (14.5°) A
	Two Phase -		
	Ground:	4,840 (-8.2°) A	5,489 (-9.6°) A
12 (TAP)	Three Phase:	4,987 (-73.9°) A	5,695 (-75.5°) A
		35.9 MVA	37.3 MVA
	Phase - Ground:	4,026 (-70.8°) A	4,571 (-73.1°) A
	Phase - Phase:	4,043 (17.6°) A	4,637 (15.6°) A
	Two Phase -		
16 (137)	Ground:	4,492 (-5.5°) A	5,118 (-7.3°) A
	Three Phase:	4,668 (-72.4°) A	5,355 (-74.4°) A
		33.6 MVA	35.1 MVA
	Phase - Ground:	2,621 (-65.1°) A	3,029 (-68.9°) A
	Phase - Phase:	2,939 (23.7°) A	3,454 (20°) A
17 (138)	Two Phase -		
	Ground:	3,162 (4°) A	3,700 (.7°) A
	Three Phase:	3,394 (-66.3°) A	3,988 (-70°) A
		24.5 MVA	26.1 MVA
	Phase - Ground:	2,566 (-64.8°) A	2,967 (-68.7°) A
18 (139)	Phase - Phase:	2,890 (24°) A	3,401 (20.2°) A
	Two Phase -		
	Ground:	3,105 (4.4°) A	3,638 (1°) A
	Three Phase:	3,337 (-66°) A	3,927 (-69.8°) A
		24 MVA	25.7 MVA
19 (140)	Phase - Ground:	2,496 (-64.6°) A	2,890 (-68.5°) A
	Phase - Phase:	2,827 (24.3°) A	3,333 (20.4°) A
	Two Phase -		
	Ground:	3,033 (4.9°) A	3,561 (1.5°) A
	Three Phase:	3,265 (-65.7°) A	3,849 (-69.6°) A
22 (141)		23.5 MVA	25.2 MVA
	Phase - Ground:	2,370 (-62.2°) A	2,762 (-66.6°) A
	Phase - Phase:	2,692 (27.5°) A	3,202 (22.9°) A
	Two Phase -		
	Ground:	2,866 (8°) A	3,401 (4°) A
	Three Phase:	3,109 (-62.5°) A	3,698 (-67.1°) A
		22.4 MVA	24.2 MVA
	Phase - Ground:	2,253 (-61.8°) A	2,630 (-66.3°) A
	Phase - Phase:	2,585 (27.9°) A	3,084 (23.2°) A
	Two Phase -		
	Ground:	2,744 (8.7°) A	3,267 (4.6°) A

	Three Phase:	2,984 (-62.1°) A 21.5 MVA	3,562 (-66.8°) A 23.3 MVA
23 (335)	Phase - Ground:	2,121 (-61.4°) A	2,482 (-66°) A
	Phase - Phase:	2,460 (28.5°) A	2,948 (23.6°) A
	Two Phase - Ground:	2,604 (9.5°) A	3,114 (5.3°) A
	Three Phase:	2,841 (-61.5°) A 20.5 MVA	3,404 (-66.4°) A 22.3 MVA
24	Phase - Ground:	2,051 (-61.2°) A	2,403 (-65.9°) A
	Phase - Phase:	2,393 (28.8°) A	2,874 (23.8°) A
	Two Phase - Ground:	2,529 (10°) A	3,032 (5.7°) A
	Three Phase:	2,763 (-61.2°) A	3,318 (-66.2°) A
		19.9 MVA	21.7 MVA
31	Phase - Ground:	1,970 (-60.9°) A	2,311 (-65.7°) A
	Phase - Phase:	2,314 (29.1°) A	2,787 (24°) A
	Two Phase - Ground:	2,441 (10.5°) A	2,935 (6.2°) A
	Three Phase:	2,672 (-60.9°) A 19.3 MVA	3,218 (-66°) A 21.1 MVA
38	Phase - Ground:	1,912 (-60.7°) A	2,246 (-65.6°) A
	Phase - Phase:	2,257 (29.4°) A	2,724 (24.2°) A
	Two Phase - Ground:	2,378 (10.9°) A	2,866 (6.5°) A
	Three Phase:	2,606 (-60.6°) A 18.8 MVA	3,146 (-65.8°) A 20.6 MVA
40 (330)	Phase - Ground:	1,867 (-60.6°) A	2,195 (-65.5°) A
	Phase - Phase:	2,213 (29.6°) A	2,675 (24.3°) A
	Two Phase - Ground:	2,329 (11.2°) A	2,812 (6.7°) A
	Three Phase:	2,555 (-60.4°) A 18.4 MVA	3,089 (-65.7°) A 20.2 MVA
41 (191)	Phase - Ground:	1,794 (-60.3°) A	2,112 (-65.3°) A
	Phase - Phase:	2,139 (29.9°) A	2,594 (24.5°) A
	Two Phase - Ground:	2,248 (11.6°) A	2,722 (7.1°) A
	Three Phase:	2,470 (-60.1°) A 17.8 MVA	2,995 (-65.5°) A 19.6 MVA
42 (S34)	Phase - Ground:	1,716 (-59.5°) A	2,026 (-64.7°) A
	Phase - Phase:	2,055 (31°) A	2,504 (25.4°) A

Two Phase -			
Ground:		2,152 (12.9°) A	2,622 (8.1°) A
Three Phase:		2,373 (-59°) A	2,892 (-64.6°) A
		17.1 MVA	18.9 MVA
43	Phase - Ground:	1,707 (-59.5°) A	2,017 (-64.6°) A
	Phase - Phase:	2,046 (31.1°) A	2,495 (25.4°) A
Two Phase -			
Ground:		2,143 (12.9°) A	2,611 (8.1°) A
Three Phase:		2,363 (-58.9°) A	2,881 (-64.6°) A
		17 MVA	18.9 MVA
59 (S34)	Phase - Ground:	1,695 (-59.3°) A	2,003 (-64.5°) A
	Phase - Phase:	2,034 (31.3°) A	2,482 (25.6°) A
Two Phase -			
Ground:		2,129 (13.1°) A	2,597 (8.3°) A
Three Phase:		2,349 (-58.7°) A	2,866 (-64.4°) A
		16.9 MVA	18.8 MVA
60 (194)	Phase - Ground:	1,660 (-58.9°) A	1,965 (-64.2°) A
		Phase - Phase:	2,000 (31.8°) A
		2,446 (26°) A	
Two Phase -			
Ground:		2,090 (13.8°) A	2,556 (8.8°) A
Three Phase:		2,309 (-58.2°) A	2,824 (-64°) A
		16.6 MVA	18.5 MVA
61 (334-1)	Phase - Ground:	1,629 (-58.5°) A	1,931 (-63.8°) A
		Phase - Phase:	1,968 (32.3°) A
		2,413 (26.4°) A	
Two Phase -			
Ground:		2,055 (14.3°) A	2,519 (9.3°) A
Three Phase:		2,273 (-57.7°) A	2,786 (-63.6°) A
		16.4 MVA	18.2 MVA
62 (334)	Phase - Ground:	1,626 (-58.5°) A	1,928 (-63.8°) A
	Phase - Phase:	1,966 (32.3°) A	2,410 (26.4°) A
Two Phase -			
Ground:		2,053 (14.4°) A	2,517 (9.4°) A
Three Phase:		2,270 (-57.7°) A	2,783 (-63.6°) A
		16.4 MVA	18.2 MVA
63 (195)	Phase - Ground:	1,594 (-58.1°) A	1,893 (-63.5°) A
	Phase - Phase:	1,934 (32.8°) A	2,376 (26.8°) A

Two Phase -			
Ground:		2,016 (14.9°) A	2,479 (9.8°) A
Three Phase:		2,233 (-57.2°) A	2,744 (-63.2°) A
		16.1 MVA	18 MVA
64 (325)	Phase - Ground:	1,553 (-57.5°) A	1,848 (-63.1°) A
	Phase - Phase:	1,892 (33.5°) A	2,332 (27.3°) A
Two Phase -			
Ground:		1,970 (15.7°) A	2,430 (10.4°) A
Three Phase:		2,185 (-56.5°) A	2,693 (-62.7°) A
		15.7 MVA	17.6 MVA
65 (196)	Phase - Ground:	1,476 (-56.6°) A	1,762 (-62.3°) A
	Phase - Phase:	1,812 (34.7°) A	2,247 (28.2°) A
Two Phase -			
Ground:		1,881 (17.1°) A	2,336 (11.6°) A
Three Phase:		2,092 (-55.3°) A	2,595 (-61.8°) A
		15.1 MVA	17 MVA
66	Phase - Ground:	1,439 (-56.1°) A	1,721 (-61.9°) A
	Phase - Phase:	1,773 (35.3°) A	2,205 (28.7°) A
Two Phase -			
Ground:		1,838 (17.7°) A	2,290 (12.2°) A
Three Phase:		2,048 (-54.7°) A	2,547 (-61.3°) A
		14.8 MVA	16.7 MVA
430	Phase - Ground:	6,135 (-79.7°) A	6,863 (-79.7°) A
	Phase - Phase:	5,313 (10.3°) A	5,994 (10.2°) A
Two Phase -			
Ground:		6,135 (-19.7°) A	6,894 (-19.3°) A
Three Phase:		6,135 (-79.7°) A	6,921 (-79.8°) A
		44.2 MVA	45.3 MVA
432	Phase - Ground:	6,135 (-79.7°) A	6,862 (-79.7°) A
	Phase - Phase:	5,313 (10.3°) A	5,994 (10.2°) A
Two Phase -			
Ground:		6,135 (-19.7°) A	6,894 (-19.3°) A
Three Phase:		6,135 (-79.7°) A	6,921 (-79.8°) A
		44.2 MVA	45.3 MVA
462	Phase - Ground:	6,135 (-79.7°) A	6,863 (-79.7°) A
	Phase - Phase:	5,313 (10.3°) A	5,994 (10.2°) A
Two Phase -			
Ground:		6,135 (-19.7°) A	6,894 (-19.3°) A
Three Phase:		6,135 (-79.7°) A	6,921 (-79.8°) A
		44.2 MVA	45.3 MVA
464	Phase - Ground:	1,394 (-55.6°) A	1,672 (-61.5°) A
	Phase - Phase:	1,726 (36°) A	2,155 (29.2°) A
Two Phase -			
Ground:		1,786 (18.5°) A	2,235 (12.8°) A
Three Phase:		1,994 (-54°) A	2,489 (-60.8°) A
		14.4 MVA	16.3 MVA
465	Phase - Ground:	1,374 (-55.3°) A	1,649 (-61.3°) A

Phase - Phase:	1,704 (36.3°) A	2,131 (29.5°) A
Two Phase -		
Ground:	1,762 (18.9°) A	2,208 (13.2°) A
Three Phase:	1,968 (-53.7°) A	2,461 (-60.5°) A
	14.2 MVA	16.1 MVA

[Top](#)

Fault Current Summary

Maximum
Fault
Condition

S					
Fault					
Type	Min Current (A)	Node	Max Current (A)	Node	
Phase -					
Ground	1649	465	6863	430	
Phase -					
Phase	2131	465	5994	430	
Phase -					
Phase -					
Ground	2208	465	6894	430	
Three					
Phase	2461	465	6921	430	

Minimum
Fault
Condition

S					
Fault					
Type	Min Current (A)	Node	Max Current (A)	Node	
Phase -					
Ground	1374		465	6135	430
Phase -					
Phase	1704		465	5313	430
Phase -					
Phase -					
Ground	1762		465	6135	430
Three					
Phase	1968		465	6135	430

[Top](#)

Short Circuit Fault Impedance

July-18-13 9:56:58 AM

Analysis Properties

System File C:\Users\
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Files-
New
Analysis\
BC - with
CAP - CIA
example.

Impedances (p.u. on 100MVA Base)

Node ID		Minimum	Maximum
5	Positive:	$0.413 + 2.2j$	$0.432 + 2.257j$
	Negative:	$0.413 + 2.2j$	$0.432 + 2.257j$
	Zero:	$2.314j$	$0.464 + 2.314j$
9 (F81-X)	Positive:	$0.396 +$	$0.409 + 2.229j$
	Negative:	$0.396 +$	$0.409 + 2.229j$
	Zero:	$0.408 +$	$0.409 + 2.229j$
11 (TAP)	Positive:	$0.67 + 2.596j$	$0.771 + 2.674j$
	Negative:	$0.67 + 2.596j$	$0.771 + 2.674j$
	Zero:	$1.119 +$	$1.29 + 3.604j$
12 (TAP)	Positive:	$0.766 +$	$0.901 + 2.833j$

	Negative:	0.766 +	0.901 + 2.833j
	Zero:	1.373 +	1.606 + 4.096j
		1.307 +	
16 (137)	Positive:	3.598j	1.643 + 3.745j
	Negative:	1.307 +	1.643 + 3.745j
	Zero:	2.829 +	3.411 + 6.912j
17 (138)	Positive:	1.34 + 3.65j	1.689 + 3.801j
	Negative:	1.34 + 3.65j	1.689 + 3.801j
		2.919 +	
	Zero:	7.085j	3.522 + 7.085j
18 (139)	Positive:	1.382 +	1.749 + 3.875j
	Negative:	1.382 +	1.749 + 3.875j
	Zero:	3.037 +	3.669 + 7.314j
19 (140)	Positive:	1.608 +	2.06 + 3.961j
		1.608 +	
	Negative:	3.802j	2.06 + 3.961j
	Zero:	3.371 +	4.083 + 7.615j
22 (141)	Positive:	1.692 +	2.18 + 4.108j
	Negative:	1.692 +	2.18 + 4.108j
	Zero:	3.606 + 8.07j	4.375 + 8.07j
		1.797 +	
23 (335)	Positive:	4.109j	2.331 + 4.294j
	Negative:	1.797 +	2.331 + 4.294j
	Zero:	3.903 +	4.742 + 8.643j
24	Positive:	1.857 +	2.419 + 4.402j
	Negative:	1.857 +	2.419 + 4.402j
		4.076 +	
	Zero:	8.978j	4.957 + 8.978j
31	Positive:	1.932 +	2.529 + 4.537j
	Negative:	1.932 +	2.529 + 4.537j
	Zero:	4.291 +	5.224 + 9.394j
38	Positive:	1.989 +	2.613 + 4.64j
		1.989 +	
	Negative:	4.427j	2.613 + 4.64j
	Zero:	4.456 +	5.428 + 9.712j
40 (330)	Positive:	2.036 +	2.681 + 4.724j
	Negative:	2.036 +	2.681 + 4.724j
	Zero:	4.589 +	5.594 + 9.971j
		2.116 +	
41 (191)	Positive:	4.637j	2.8 + 4.87j
	Negative:	2.116 +	2.8 + 4.87j
		4.824 +	
	Zero:	10.424j	5.884 + 10.424j
42 (S34)	Positive:	2.265 +	3.016 + 5.012j
	Negative:	2.265 +	3.016 + 5.012j
		5.143 +	
	Zero:	10.89j	6.281 + 10.89j

	43	Positive:	2.275 +	3.032 + 5.031j
		Negative:	2.275 +	3.032 + 5.031j
			5.174 +	
		Zero:	10.949j	6.319 + 10.949j
59 (S34)		Positive:	2.299 +	3.066 + 5.05j
			2.299 +	
		Negative:	4.805j	3.066 + 5.05j
			5.237 +	
		Zero:	11.028j	6.397 + 11.028j
60 (194)		Positive:	2.368 +	3.167 + 5.108j
		Negative:	2.368 +	3.167 + 5.108j
			5.421 +	
		Zero:	11.258j	6.625 + 11.258j
61 (334-1)		Positive:	2.433 + 4.91j	3.262 + 5.162j
		Negative:	2.433 + 4.91j	3.262 + 5.162j
			5.593 +	
		Zero:	11.473j	6.838 + 11.473j
62 (334)		Positive:	2.438 +	3.269 + 5.166j
		Negative:	2.438 +	3.269 + 5.166j
			5.606 +	
		Zero:	11.488j	6.854 + 11.488j
63 (195)		Positive:	2.507 +	3.37 + 5.223j
		Negative:	2.507 +	3.37 + 5.223j
		Zero:	5.79 +	7.082 + 11.718j
64 (325)		Positive:	2.598 +	3.503 + 5.299j
			2.598 +	
		Negative:	5.039j	3.503 + 5.299j
			6.031 +	
		Zero:	12.021j	7.382 + 12.021j
65 (196)		Positive:	2.781 +	3.775 + 5.454j
		Negative:	2.781 +	3.775 + 5.454j
			6.526 +	
		Zero:	12.638j	7.995 + 12.638j
66		Positive:	2.875 + 5.26j	3.914 + 5.534j
		Negative:	2.875 + 5.26j	3.914 + 5.534j
		Zero:	6.78 +	8.31 + 12.957j
430		Positive:	0.392 +	0.405 + 2.226j
		Negative:	0.392 +	0.405 + 2.226j
			0.405 +	
		Zero:	2.226j	0.405 + 2.226j
432		Positive:	0.392 +	0.405 + 2.226j
		Negative:	0.392 +	0.405 + 2.226j
		Zero:	0.405 +	0.405 + 2.226j
462		Positive:	0.392 +	0.405 + 2.226j

		0.392 +	
	Negative:	2.171j	0.405 + 2.226j
	Zero:	0.405 +	0.405 + 2.226j
464	Positive:	2.993 +	4.09 + 5.634j
	Negative:	2.993 +	4.09 + 5.634j
	Zero:	7.1 + 13.356j	8.707 + 13.356j
		3.051 +	
465	Positive:	5.402j	4.177 + 5.683j
	Negative:	3.051 +	4.177 + 5.683j
		7.258 +	
	Zero:	13.554j	8.902 + 13.554j

Fault levels and Thevenin Impedances at Lorne Street Point of Common Connection (PCC) on T4 (F8) Feeder – Solar Generation Connected (4.16 kV)									
Fault Type	3 ph (A)	Ph-Ph (A)	Ph-G (A)	Minimum Impedance (P.U. on 100 MVA Base)				X/R Ratio	
				R1	X1	R0	X0	X1/R1	X0/R0
Minimum Fault Current	1,994	1,726	1,394	2.993	5.355	7.1	13.356	1.7892	1.88113
	(-54.0)	36	(-55.6)						
	3 ph (A)	Ph-Ph (A)	Ph-G (A)	Maximum Impedance (P.U. on 100 MVA Base)				X/R Ratio	
Maximum Fault Current	2,489	2,155	1,672	R1	X1	R0	X0	X1/R1	X0/R0
	(-60.8)	29.2	(-61.5)	4.09	5.634	8.707	13.356	1.3775	1.53394

Fault Current downstream of T4 (F8) on 4.16kV is low comparing to higher of the stream line.

The X/R is lower for rating the equipment for DG system

Short Circuit Fault Currents

July-18-13 10:04:17 AM

See below for more info. on node ID of 464

[Fault Current Details](#)

[Fault Current Summary](#)

Analysis Properties

System
File

Fault Currents:

Node ID:	Current	Minimum	Maximum
5	Phase - Ground:	5,986 (-79°) A	6,589 (-79.2°) A
	Phase - Phase:	5,231 (10.8°) A	5,757 (10.7°) A
	Two Phase -		
	Ground:	6,029 (-18.6°) A	6,631 (-18.8°) A
	Three Phase:	6,041 (-79.2°) A	6,648 (-79.3°) A
9 (F81-X)		43.5 MVA	43.5 MVA
	Phase - Ground:	6,124 (-79.6°) A	6,737 (-79.6°) A
	Phase - Phase:	5,303 (10.4°) A	5,834 (10.4°) A
	Two Phase -		
	Ground:	6,124 (-19.6°) A	6,737 (-19.6°) A
11 (TAP)	Three Phase:	6,124 (-79.6°) A	6,737 (-79.6°) A
		44.1 MVA	44.1 MVA
	Phase - Ground:	4,434 (-72.4°) A	4,925 (-74.3°) A
	Phase - Phase:	4,319 (16.1°) A	4,783 (14.7°) A
	Two Phase -		
12 (TAP)	Ground:	4,840 (-8.2°) A	5,339 (-9.9°) A
	Three Phase:	4,987 (-73.9°) A	5,523 (-75.3°) A
		35.9 MVA	36.2 MVA
	Phase - Ground:	4,026 (-70.8°) A	4,486 (-73°) A
	Phase - Phase:	4,043 (17.6°) A	4,489 (15.9°) A
	Two Phase -		
	Ground:	4,492 (-5.5°) A	4,967 (-7.6°) A
	Three Phase:	4,668 (-72.4°) A	5,183 (-74.1°) A
		33.6 MVA	34 MVA

16 (137)	Phase - Ground:	2,621 (-65.1°) A	2,961 (-68.6°) A
	Phase - Phase:	2,939 (23.7°) A	3,306 (20.5°) A
	Two Phase -		
	Ground:	3,162 (4°) A	3,547 (.6°) A
	Three Phase:	3,394 (-66.3°) A	3,817 (-69.5°) A
17 (138)		24.5 MVA	25 MVA
	Phase - Ground:	2,566 (-64.8°) A	2,900 (-68.5°) A
	Phase - Phase:	2,890 (24°) A	3,253 (20.8°) A
	Two Phase -		
	Ground:	3,105 (4.4°) A	3,486 (1°) A
18 (139)	Three Phase:	3,337 (-66°) A	3,756 (-69.2°) A
		24 MVA	24.6 MVA
	Phase - Ground:	2,496 (-64.6°) A	2,824 (-68.2°) A
	Phase - Phase:	2,827 (24.3°) A	3,185 (21°) A
	Two Phase -		
19 (140)	Ground:	3,033 (4.9°) A	3,408 (1.4°) A
	Three Phase:	3,265 (-65.7°) A	3,678 (-69°) A
		23.5 MVA	24.1 MVA
	Phase - Ground:	2,370 (-62.2°) A	2,697 (-66.2°) A
	Phase - Phase:	2,692 (27.5°) A	3,056 (23.7°) A
22 (141)	Two Phase -		
	Ground:	2,866 (8°) A	3,248 (4.1°) A
	Three Phase:	3,109 (-62.5°) A	3,529 (-66.3°) A
		22.4 MVA	23.1 MVA
	Phase - Ground:	2,253 (-61.8°) A	2,567 (-65.9°) A
23 (335)	Phase - Phase:	2,585 (27.9°) A	2,938 (24.1°) A
	Two Phase -		
	Ground:	2,744 (8.7°) A	3,114 (4.7°) A
	Three Phase:	2,984 (-62.1°) A	3,393 (-65.9°) A
		21.5 MVA	22.2 MVA
24	Phase - Ground:	2,121 (-61.4°) A	2,420 (-65.6°) A
	Phase - Phase:	2,460 (28.5°) A	2,802 (24.5°) A
	Two Phase -		
	Ground:	2,604 (9.5°) A	2,961 (5.5°) A
	Three Phase:	2,841 (-61.5°) A	3,235 (-65.5°) A
31		20.5 MVA	21.2 MVA
	Phase - Ground:	2,051 (-61.2°) A	2,342 (-65.4°) A
	Phase - Phase:	2,393 (28.8°) A	2,728 (24.7°) A
	Two Phase -		
	Ground:	2,529 (10°) A	2,878 (5.9°) A
	Three Phase:	2,763 (-61.2°) A	3,150 (-65.3°) A
		19.9 MVA	20.6 MVA
	Phase - Ground:	1,970 (-60.9°) A	2,252 (-65.2°) A
	Phase - Phase:	2,314 (29.1°) A	2,641 (25°) A
	Two Phase -		
	Ground:	2,441 (10.5°) A	2,782 (6.3°) A
	Three Phase:	2,672 (-60.9°) A	3,049 (-65°) A

		19.3 MVA	20 MVA
38	Phase - Ground:	1,912 (-60.7°) A	2,187 (-65.1°) A
	Phase - Phase:	2,257 (29.4°) A	2,578 (25.2°) A
	Two Phase -		
	Ground:	2,378 (10.9°) A	2,712 (6.6°) A
	Three Phase:	2,606 (-60.6°) A	2,977 (-64.8°) A
		18.8 MVA	19.5 MVA
40 (330)	Phase - Ground:	1,867 (-60.6°) A	2,137 (-65°) A
	Phase - Phase:	2,213 (29.6°) A	2,529 (25.4°) A
	Two Phase -		
	Ground:	2,329 (11.2°) A	2,658 (6.9°) A
	Three Phase:	2,555 (-60.4°) A	2,920 (-64.6°) A
		18.4 MVA	19.1 MVA
41 (191)	Phase - Ground:	1,794 (-60.3°) A	2,055 (-64.8°) A
	Phase - Phase:	2,139 (29.9°) A	2,448 (25.6°) A
	Two Phase -		
	Ground:	2,248 (11.6°) A	2,569 (7.3°) A
	Three Phase:	2,470 (-60.1°) A	2,826 (-64.4°) A
		17.8 MVA	18.5 MVA
42 (S34)	Phase - Ground:	1,716 (-59.5°) A	1,970 (-64.1°) A
	Phase - Phase:	2,055 (31°) A	2,359 (26.6°) A
	Two Phase -		
	Ground:	2,152 (12.9°) A	2,468 (8.4°) A
	Three Phase:	2,373 (-59°) A	2,724 (-63.4°) A
		17.1 MVA	17.8 MVA
43	Phase - Ground:	1,707 (-59.5°) A	1,960 (-64.1°) A
	Phase - Phase:	2,046 (31.1°) A	2,349 (26.6°) A
	Two Phase -		
	Ground:	2,143 (12.9°) A	2,457 (8.4°) A
	Three Phase:	2,363 (-58.9°) A	2,713 (-63.4°) A
		17 MVA	17.8 MVA
59 (S34)	Phase - Ground:	1,695 (-59.3°) A	1,947 (-63.9°) A
	Phase - Phase:	2,034 (31.3°) A	2,337 (26.8°) A
	Two Phase -		
	Ground:	2,129 (13.1°) A	2,443 (8.6°) A
	Three Phase:	2,349 (-58.7°) A	2,698 (-63.2°) A
		16.9 MVA	17.7 MVA
60 (194)	Phase - Ground:	1,660 (-58.9°) A	1,909 (-63.5°) A
	Phase - Phase:	2,000 (31.8°) A	2,301 (27.3°) A
	Two Phase -		
	Ground:	2,090 (13.8°) A	2,403 (9.2°) A
	Three Phase:	2,309 (-58.2°) A	2,657 (-62.7°) A

		16.6 MVA	17.4 MVA
61 (334-1)	Phase - Ground:	1,629 (-58.5°) A	1,875 (-63.2°) A
	Phase - Phase:	1,968 (32.3°) A	2,268 (27.7°) A
	Two Phase - Ground:	2,055 (14.3°) A	2,366 (9.7°) A
	Three Phase:	2,273 (-57.7°) A	2,619 (-62.3°) A
		16.4 MVA	17.2 MVA
62 (334)	Phase - Ground:	1,626 (-58.5°) A	1,873 (-63.2°) A
	Phase - Phase:	1,966 (32.3°) A	2,266 (27.7°) A
	Two Phase - Ground:	2,053 (14.4°) A	2,363 (9.8°) A
	Three Phase:	2,270 (-57.7°) A	2,616 (-62.3°) A
		16.4 MVA	17.1 MVA
63 (195)	Phase - Ground:	1,594 (-58.1°) A	1,838 (-62.8°) A
	Phase - Phase:	1,934 (32.8°) A	2,232 (28.2°) A
	Two Phase - Ground:	2,016 (14.9°) A	2,325 (10.3°) A
	Three Phase:	2,233 (-57.2°) A	2,577 (-61.8°) A
		16.1 MVA	16.9 MVA
64 (325)	Phase - Ground:	1,553 (-57.5°) A	1,794 (-62.4°) A
	Phase - Phase:	1,892 (33.5°) A	2,188 (28.7°) A
	Two Phase - Ground:	1,970 (15.7°) A	2,276 (10.9°) A
	Three Phase:	2,185 (-56.5°) A	2,527 (-61.3°) A
		15.7 MVA	16.5 MVA
65 (196)	Phase - Ground:	1,476 (-56.6°) A	1,710 (-61.5°) A
	Phase - Phase:	1,812 (34.7°) A	2,104 (29.8°) A
	Two Phase - Ground:	1,881 (17.1°) A	2,182 (12.2°) A
	Three Phase:	2,092 (-55.3°) A	2,429 (-60.2°) A
		15.1 MVA	15.9 MVA
66	Phase - Ground:	1,439 (-56.1°) A	1,669 (-61.1°) A
	Phase - Phase:	1,773 (35.3°) A	2,063 (30.3°) A
	Two Phase - Ground:	1,838 (17.7°) A	2,137 (12.8°) A
	Three Phase:	2,048 (-54.7°) A	2,382 (-59.7°) A
		14.8 MVA	15.6 MVA
430	Phase - Ground:	6,135 (-79.7°) A	6,749 (-79.7°) A
	Phase - Phase:	5,313 (10.3°) A	5,845 (10.3°) A

Two Phase -			
Ground:		6,135 (-19.7°) A	6,749 (-19.7°) A
Three Phase:		6,135 (-79.7°) A	6,749 (-79.7°) A
		44.2 MVA	44.2 MVA
432	Phase - Ground:	6,135 (-79.7°) A	6,749 (-79.7°) A
	Phase - Phase:	5,313 (10.3°) A	5,845 (10.3°) A
Two Phase -			
Ground:		6,135 (-19.7°) A	6,749 (-19.7°) A
Three Phase:		6,135 (-79.7°) A	6,749 (-79.7°) A
		44.2 MVA	44.2 MVA
462	Phase - Ground:	6,135 (-79.7°) A	6,749 (-79.7°) A
	Phase - Phase:	5,313 (10.3°) A	5,845 (10.3°) A
Two Phase -			
Ground:		6,135 (-19.7°) A	6,749 (-19.7°) A
Three Phase:		6,135 (-79.7°) A	6,749 (-79.7°) A
		44.2 MVA	44.2 MVA
464	Phase - Ground:	1,394 (-55.6°) A	1,621 (-60.6°) A
	Phase - Phase:	1,726 (36°) A	2,013 (30.9°) A
Two Phase -			
Ground:		1,786 (18.5°) A	2,082 (13.6°) A
Three Phase:		1,994 (-54°) A	2,324 (-59.1°) A
		14.4 MVA	15.2 MVA
465	Phase - Ground:	1,374 (-55.3°) A	1,598 (-60.4°) A
	Phase - Phase:	1,704 (36.3°) A	1,989 (31.2°) A
Two Phase -			
Ground:		1,762 (18.9°) A	2,055 (13.9°) A
Three Phase:		1,968 (-53.7°) A	2,297 (-58.8°) A
		14.2 MVA	15 MVA

[Top](#)

Fault Current Summary

Maximum
Fault
Conditions

Fault Type	Min Current (A)	Node	Max Current (A)	Node
Phase - Ground	1598	465	6749	430
Phase - Phase	1989	465	5845	430

Phase -				
Phase -				
Ground	2055	465	6749	430
Three				
Phase	2297	465	6749	430

Minimum
Fault
Conditions

Fault Type	Min Current (A)	Node	Max Current (A)	Node
Phase -				
Ground	1374	465	6135	430
Phase -				
Phase	1704	465	5313	430
Phase -				
Phase -				
Ground	1762	465	6135	430
Three				
Phase	1968	465	6135	430

[Top](#)

Short Circuit Fault Impedance

July-18-13 10:04:11 AM

Analysis Properties

Impedances (p.u. on 100MVA Base)

Node ID	Minimum	Maximum
5	Positive: $0.426 + 2.257j$ Negativ $0.426 + 2.257j$ Zero: $0.452 + 2.314j$	$0.432 + 2.257j$ $0.432 + 2.257j$ $0.464 + 2.314j$
9 (F81-	Positive: $0.408 + 2.229j$ Negativ $0.408 + 2.229j$ Zero: $0.408 + 2.229j$	$0.409 + 2.229j$ $0.409 + 2.229j$ $0.409 + 2.229j$
11	Positive: $0.7 + 2.674j$ Negativ e: $0.7 + 2.674j$ Zero: $1.119 + 3.604j$	$0.771 + 2.674j$ $0.771 + 2.674j$ $1.29 + 3.604j$
12	Positive: $0.805 + 2.833j$ Negativ $0.805 + 2.833j$ Zero: $1.373 + 4.096j$	$0.901 + 2.833j$ $0.901 + 2.833j$ $1.606 + 4.096j$
16		
(137)	Positive: $1.404 + 3.745j$ Negativ $1.404 + 3.745j$ Zero: $2.829 + 6.912j$	$1.643 + 3.745j$ $1.643 + 3.745j$ $3.411 + 6.912j$
17	Positive: $1.44 + 3.801j$ Negativ $1.44 + 3.801j$ Zero: $2.919 + 7.085j$	$1.689 + 3.801j$ $1.689 + 3.801j$ $3.522 + 7.085j$
18	Positive: $1.489 + 3.875j$ Negativ $1.489 + 3.875j$ Zero: $3.037 + 7.314j$	$1.749 + 3.875j$ $1.749 + 3.875j$ $3.669 + 7.314j$
19	Positive: $1.739 + 3.961j$ Negativ e: $1.739 + 3.961j$ Zero: $3.371 + 7.615j$	$2.06 + 3.961j$ $2.06 + 3.961j$ $4.083 + 7.615j$
22	Positive: $1.836 + 4.108j$	$2.18 + 4.108j$

	Negativ	$1.836 + 4.108j$	$2.18 + 4.108j$
	Zero:	$3.606 + 8.07j$	$4.375 + 8.07j$
23			
(335)	Positive:	$1.958 + 4.294j$	$2.331 + 4.294j$
	Negativ	$1.958 + 4.294j$	$2.331 + 4.294j$
	Zero:	$3.903 + 8.643j$	$4.742 + 8.643j$
24	Positive:	$2.029 + 4.402j$	$2.419 + 4.402j$
	Negativ	$2.029 + 4.402j$	$2.419 + 4.402j$
	Zero:	$4.076 + 8.978j$	$4.957 + 8.978j$
31	Positive:	$2.118 + 4.537j$	$2.529 + 4.537j$
	Negativ	$2.118 + 4.537j$	$2.529 + 4.537j$
	Zero:	$4.291 + 9.394j$	$5.224 + 9.394j$
38	Positive:	$2.185 + 4.64j$	$2.613 + 4.64j$
	Negativ		
	e:	$2.185 + 4.64j$	$2.613 + 4.64j$
	Zero:	$4.456 + 9.712j$	$5.428 + 9.712j$
40	Positive:	$2.24 + 4.724j$	$2.681 + 4.724j$
	Negativ	$2.24 + 4.724j$	$2.681 + 4.724j$
	Zero:	$4.589 + 9.971j$	$5.594 + 9.971j$
41			
(191)	Positive:	$2.337 + 4.87j$	$2.8 + 4.87j$
	Negativ	$2.337 + 4.87j$	$2.8 + 4.87j$
	Zero:	$4.824 +$	$5.884 + 10.424j$
42	Positive:	$2.511 + 5.012j$	$3.016 + 5.012j$
	Negativ	$2.511 + 5.012j$	$3.016 + 5.012j$
	Zero:	$5.143 + 10.89j$	$6.281 + 10.89j$
43	Positive:	$2.523 + 5.031j$	$3.032 + 5.031j$
	Negativ	$2.523 + 5.031j$	$3.032 + 5.031j$
	Zero:	$5.174 +$	$6.319 + 10.949j$
59	Positive:	$2.551 + 5.05j$	$3.066 + 5.05j$
	Negativ		
	e:	$2.551 + 5.05j$	$3.066 + 5.05j$
	Zero:	$5.237 +$	$6.397 + 11.028j$
60	Positive:	$2.633 + 5.108j$	$3.167 + 5.108j$
	Negativ	$2.633 + 5.108j$	$3.167 + 5.108j$
	Zero:	$5.421 +$	$6.625 + 11.258j$
61 (334-			
1)	Positive:	$2.709 + 5.162j$	$3.262 + 5.162j$
	Negativ	$2.709 + 5.162j$	$3.262 + 5.162j$
	Zero:	$5.593 +$	$6.838 + 11.473j$
62	Positive:	$2.715 + 5.166j$	$3.269 + 5.166j$
	Negativ	$2.715 + 5.166j$	$3.269 + 5.166j$
		$5.606 +$	
	Zero:	$11.488j$	$6.854 + 11.488j$
63	Positive:	$2.796 + 5.223j$	$3.37 + 5.223j$

64 Negativ $2.796 + 5.223j$ $3.37 + 5.223j$
 Zero: $5.79 + 11.718j$ $7.082 + 11.718j$
 Positive: $2.903 + 5.299j$ $3.503 + 5.299j$
 Negativ
 e: $2.903 + 5.299j$ $3.503 + 5.299j$
 Zero: $6.031 +$ $7.382 + 12.021j$
 65 Positive: $3.122 + 5.454j$ $3.775 + 5.454j$
 Negativ $3.122 + 5.454j$ $3.775 + 5.454j$
 Zero: $6.526 +$ $7.995 + 12.638j$

 66 Positive: $3.235 + 5.534j$ $3.914 + 5.534j$
 Negativ $3.235 + 5.534j$ $3.914 + 5.534j$
 Zero: $6.78 + 12.957j$ $8.31 + 12.957j$
 430 Positive: $0.405 + 2.226j$ $0.405 + 2.226j$
 Negativ $0.405 + 2.226j$ $0.405 + 2.226j$

 Zero: $0.405 + 2.226j$ $0.405 + 2.226j$
 432 Positive: $0.405 + 2.226j$ $0.405 + 2.226j$
 Negativ $0.405 + 2.226j$ $0.405 + 2.226j$
 Zero: $0.405 + 2.226j$ $0.405 + 2.226j$
 462 Positive: $0.405 + 2.226j$ $0.405 + 2.226j$
 Negativ
 e: $0.405 + 2.226j$ $0.405 + 2.226j$
 Zero: $0.405 + 2.226j$ $0.405 + 2.226j$
 464 Positive: $3.377 + 5.634j$ $4.09 + 5.634j$
 Negativ $3.377 + 5.634j$ $4.09 + 5.634j$
 Zero: $7.1 + 13.356j$ $8.707 + 13.356j$

 465 Positive: $3.447 + 5.683j$ $4.177 + 5.683j$
 Negativ $3.447 + 5.683j$ $4.177 + 5.683j$
 Zero: $7.258 +$ $8.902 + 13.554j$

Fault levels and Thevenin Impedances at Lorne Street Point of Common Connection (PCC) on T4 (F8) Feeder – Solar Generation Not Connected (4.16 kV)									
Fault Type	3 ph (A)	Ph-Ph (A)	Ph-G (A)	Minimum Impedance (P.U. on 100 MVA Base)				X/R Ratio	
				R1	X1	R0	X0	X1/R1	X0/R0

Minimum Fault Current	1,994	1,726	1,394	3.377	5.634	7.1	13.36	1.66834	1.8811
	(-54.0)	36	(-55.6)						
	3 ph (A)	Ph-Ph (A)	Ph-G (A)	Maximum Impedance (P.U. on 100 MVA Base)				X/R Ratio	
Maximum Fault Current	2,324	2,013	1,621	R1	X1	R0	X0	X1/R1	X0/R0
	(-59.1)	30.9	(-60.6)	4.09	5.634	8.707	13.36	1.37751	1.5339

Fault Current downstream of T4 (F8) on 4.16kV is low comparing to higher of the stream line.