



Eaton Vaultgard Monitoring Project

See a typical vault configuration (page 17) with H&L's Model 570E beside the Eaton VaultGard equipment.

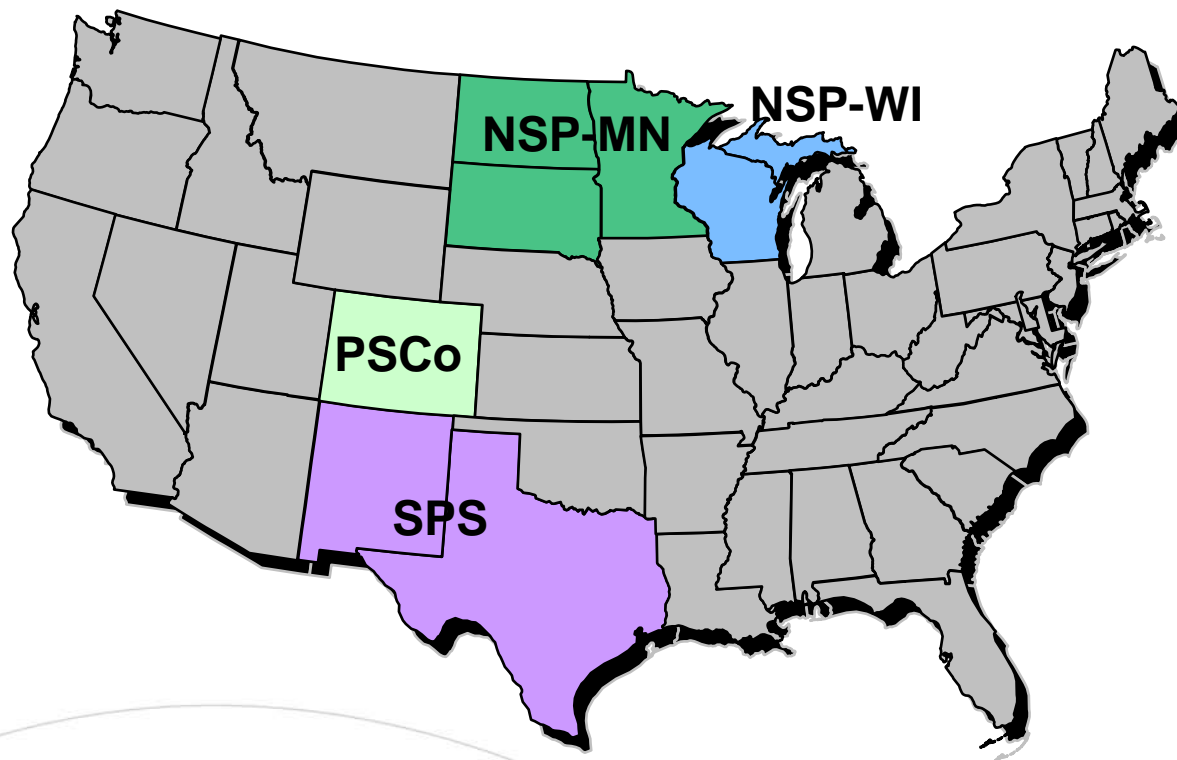
Tom Thode, Rick Kernan

Xcel Energy

March 25-28, 2013



Xcel Energy's Footprint



Customers

- 3.4 M electric
- 1.9 M natural gas

Generation Capacity (Net Dependable Capacity)

- 17,154 MW

Electric Transmission

- 70,104 (≥ 115 kV)

Natural Gas T&D

- 35,791 miles

Vault Installations
Negative Power Factor
Bad In-Line Limiters
Time Delay and Over Current Sensitive Trip
Miss-Matched Impedance
Transformer With Incorrect Tap Changer
Bad Transformer
Bad “B” Contact

Vault Configurations and Equipment Installation





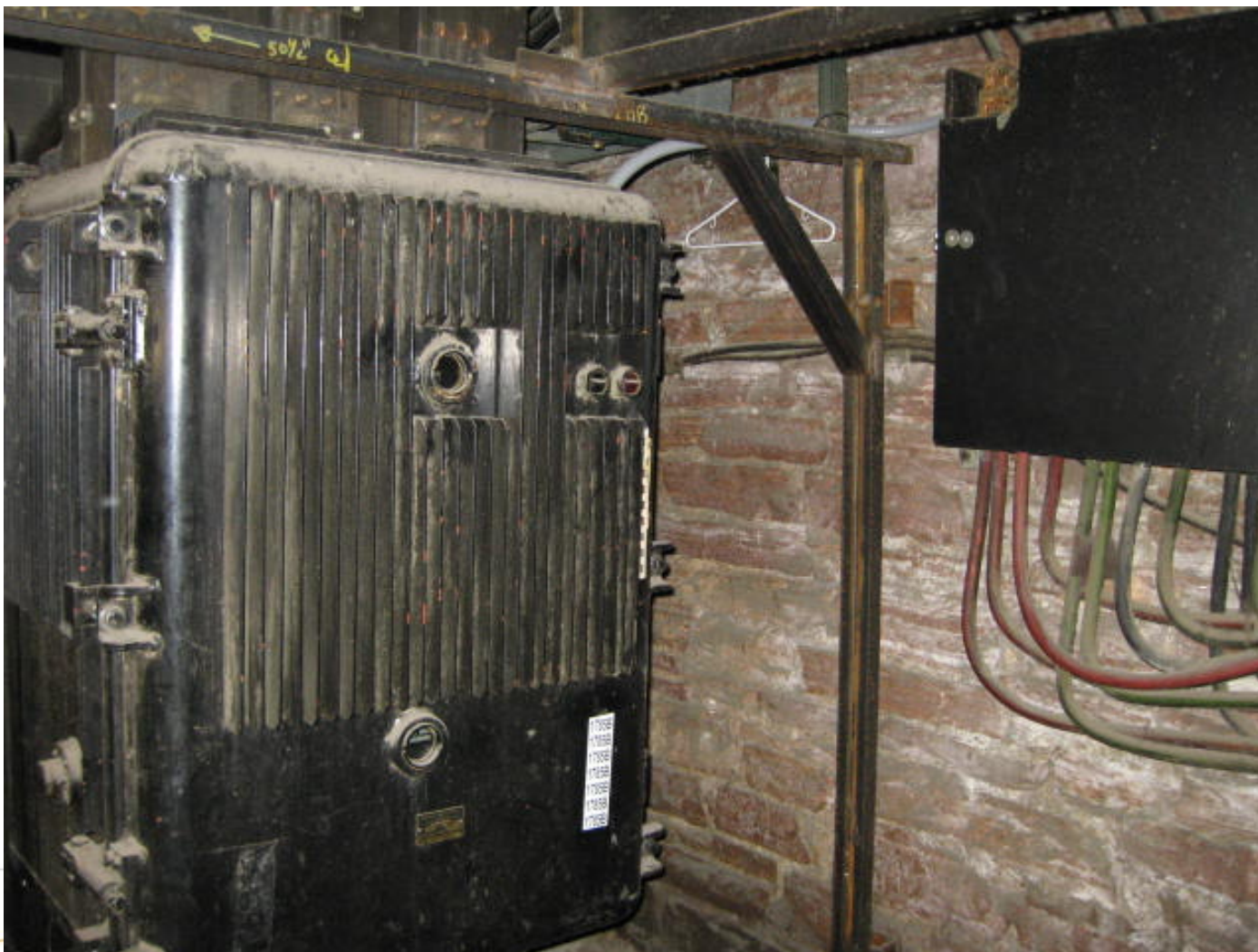






















NOTE: H&L Instruments (blue box on right) uses a serial DNP port to communicate protection relay data from the VaultGuard to a 570X transceiver at the head-end, which uses the UDP protocol to send the DNP data to the SCADA master over Ethernet. This scheme affords a measure of security by eliminating the need for Ethernet in each vault.







Negative Power Factor










Network Protector
VAULTGARD

EATON

Critical:	45	VaultGard Title
Cautionary:	4	01/14/2013 1
Controls:	Remote	Den Justice C
		<input checked="" type="checkbox"/> Enable 30


- Data View
 - System View
 - Feeders
 - Protectors
 - Vaults
 - Spot Networks
 - System Status
- Alarms
 - Alarm Status
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 - SCADA (DNP Slave)
- Device Configuration
 - Relays
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 - Remove Device
- Field Bus Configuration
 - INCOM
 - DNP
- Documentation
 - Eaton Website
 - Eaton Network Protector
 - Software Licenses

Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
1057P-CAPI2759-Denver Justice Center Courthouse - West Side	Closed	Closed	202	227	277	282 282 282	282 282 282	0.1 0.2 0.1	189	-57	-0.95	18	46.0	Inactive	Inactive	Inactive
1058P-CAPI2760-Denver Justice Center Courthouse - West Side	Closed	Closed	203	225	280	282 281 281	282 280 280	0.1 0.6 0.5	191	-55	-0.95	23	46.0	Inactive	Inactive	Inactive
1059P-CAPI2761-Denver Justice Center Courthouse - West Side	Closed	Closed	197	219	267	282 281 281	282 281 280	0.4 0.1 0.3	185	-50	-0.97	19	44.0	Inactive	Inactive	Inactive
1060P-CAPI2759-Denver Justice Center Jail - East Side	Closed	Closed	240	248	267	280 280 278	280 280 278	0.1 0.2 0.0	200	58	0.95	29	46.0	Inactive	Inactive	Inactive
1061P-CAPI2760-Denver Justice Center Jail - East Side	Closed	Closed	252	252	280	281 281 280	280 280 279	0.3 0.4 0.2	210	54	0.96	26	46.0	Inactive	Inactive	Inactive
1062P-CAPI2761-Denver Justice Center Jail - East Side	Closed	Closed	244	249	278	280 281 278	280 280 279	0.7 0.5 0.7	204	58	0.95	26	44.0	Inactive	Inactive	Inactive
1083P-CAPI2759-DENVER CRIME LAB	Closed	Closed	76	77	83	282 282 281	282 282 281	0.0 0.2 0.1	63	14	0.96	21	38.0	Inactive	Inactive	Inactive
1084P-CAPI2760-DENVER CRIME LAB	Closed	Closed	74	77	83	281 282 282	280 282 280	0.2 0.2 1.3	63	10	0.97	17	41.0	Inactive	Inactive	Inactive
1085P-CAPI2761-DENVER CRIME LAB	Closed	Closed	75	75	81	280 282 281	280 282 281	0.1 0.2 0.1	62	12	0.97	18	41.0	Inactive	Inactive	Inactive



Network Protector

VAULTGARD



Critical:	44
Cautionary:	4
Controls:	Remote

VaultGuard Time:
01/04/2013 14:03:12 MST
Den Justice Center
☒ Enable 30 second auto-refresh

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 - Software Licenses

Name: 1058P-CAP12760-Denver Justice Center Courthouse - West Side

Address: A58

Configuration:

- [View Setpoints](#)
- [View Trip Log](#)

Status: Closed

Reason: Normal

Operations: 22

Firmware Version	1.016
Breaker Position	Closed
Remote Trip (ROBO)	Inactive
Attempting Remote Protective Close	false

	A	B	C
Currents	303	318	381
Network Voltages (L-N)	282	283	282
Transformer Voltages (L-N)	282	282	282
Phasing Voltages	0.1	0.6	0.5

Pos Seq Phasing Voltage	0.4
Pos Seq Phasing Angle	180.0

Actions:

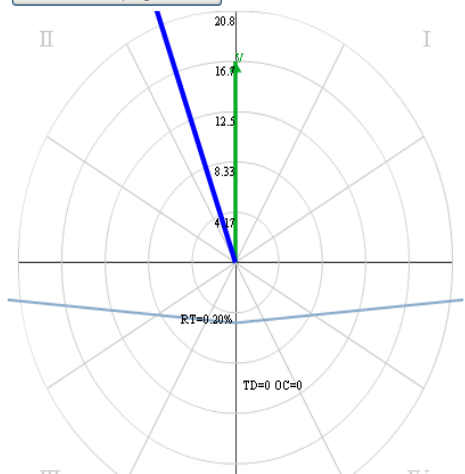
Protective Close On

Protective Close Off

Reset Pumping Fault

ROBO On

ROBO Off

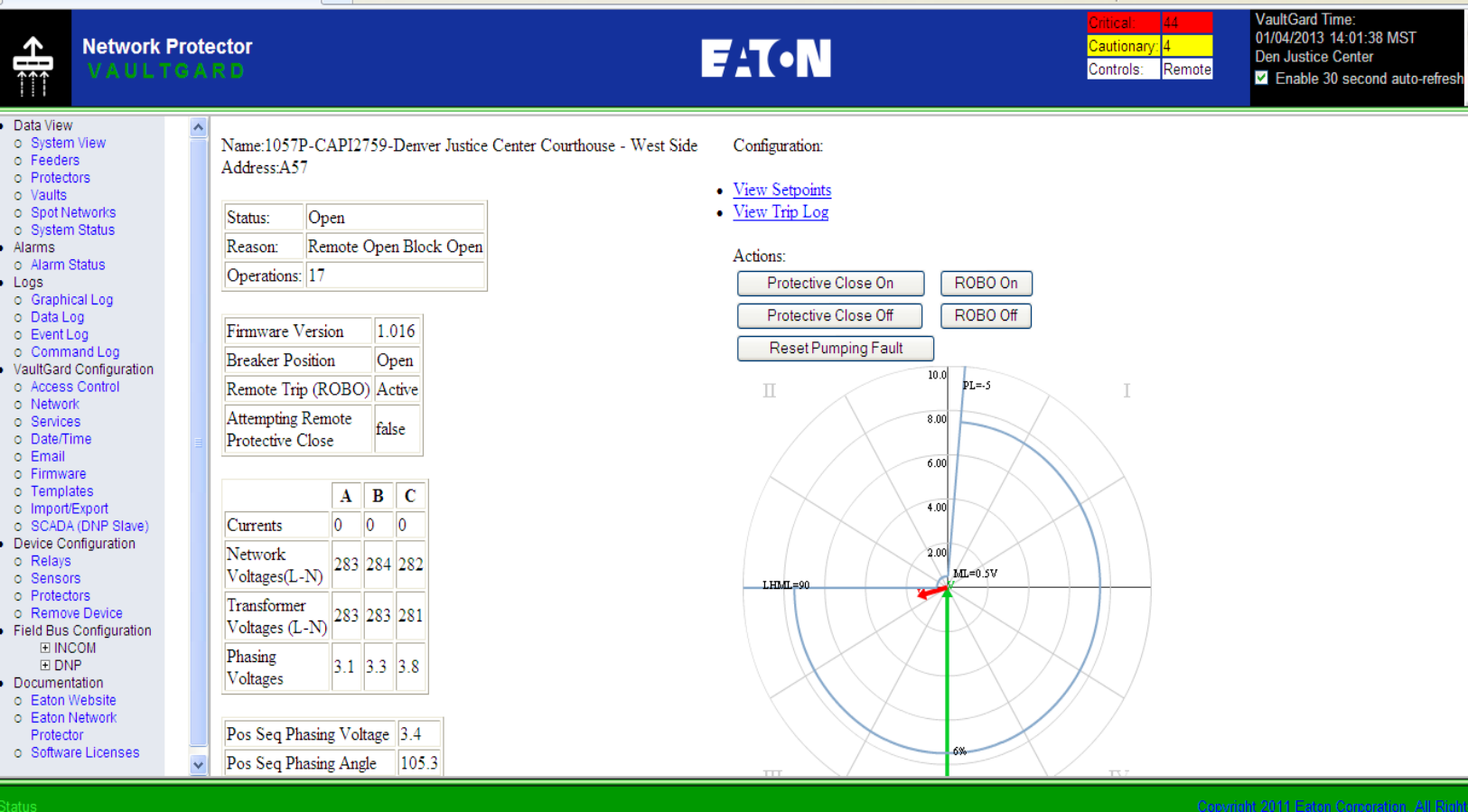


Critical: 44
Cautionary: 4
Controls: Remote

VaultGard Time:
01/04/2013 14:02:18 MST
Den Justice Center
☒ Enable 30 second auto-refres

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Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
1057P-CAPI2759-Denver Justice Center Courthouse - West Side	Open	Open	0	0	0	283 283 282	283 283 282	3.2 3.3 3.8	0	0	1.00	17	47.0	Inactive	Inactive	Inactive
1058P-CAPI2760-Denver Justice Center Courthouse - West Side	Closed	Closed	300	311	380	282 283 281	282 283 280	0.1 0.6 0.5	264	-90	-0.94	22	47.0	Inactive	Inactive	Inactive
1059P-CAPI2761-Denver Justice Center Courthouse - West Side	Closed	Closed	286	301	363	282 283 281	283 283 281	0.4 0.1 0.3	254	-80	-0.95	19	44.0	Inactive	Inactive	Inactive
1060P-CAPI2759-Denver Justice Center Jail - East Side	Closed	Closed	230	239	246	281 281 279	281 281 279	0.1 0.2 0.1	189	60	0.95	29	47.0	Inactive	Inactive	Inactive
1061P-CAPI2760-Denver Justice Center Jail - East Side	Closed	Closed	236	239	250	281 282 281	281 281 281	0.3 0.4 0.2	194	55	0.96	26	47.0	Inactive	Inactive	Inactive
1062P-CAPI2761-Denver Justice Center Jail - East Side	Closed	Closed	228	233	248	280 282 279	281 281 280	0.8 0.5 0.8	188	59	0.95	26	46.0	Inactive	Inactive	Inactive
1083P-CAPI2759-DENVER CRIME LAB	Closed	Closed	76	77	84	282 284 281	282 284 281	0.0 0.2 0.1	64	12	0.96	21	41.0	Inactive	Inactive	Inactive
1084P-CAPI2760-DENVER CRIME LAB	Closed	Closed	74	76	80	281 283 283	281 283 281	0.3 0.2 1.8	62	9	0.98	17	43.0	Inactive	Inactive	Inactive
1085P-CAPI2761-DENVER CRIME LAB	Closed	Closed	75	74	79	283 283 282	283 282 281	0.1 0.2 0.1	62	10	0.97	18	42.0	Inactive	Inactive	Inactive





Network Protector
VAULTGUARD

EAT•N

Critical: 45
Cautionary: 4
Controls: Remote

VaultGard Time:
01/14/2013 12:59:52 MST
Den Justice Center
☒ Enable 30 second auto-refresh

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Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
1057P-CAPI2759-Denver Justice Center Courthouse - West Side	Open	Open	0	0	0	282 283 282	282 282 281	6.5 7.3 9.0	0	0	1.00	17	46.0	Inactive	Inactive	Inactive
1058P-CAPI2760-Denver Justice Center Courthouse - West Side	Open	Open	0	0	0	280 283 282	280 282 280	6.3 6.9 8.6	0	0	1.00	22	45.0	Inactive	Inactive	Inactive
1059P-CAPI2761-Denver Justice Center Courthouse - West Side	Closed	Closed	571	634	783	282 283 282	282 283 281	0.4 0.1 0.2	536	-155	-0.96	19	44.0	Inactive	Inactive	Inactive
1060P-CAPI2759-Denver Justice Center Jail - East Side	Closed	Closed	241	248	262	279 281 279	280 281 280	0.1 0.2 0.1	200	54	0.95	29	46.0	Inactive	Inactive	Inactive
1061P-CAPI2760-Denver Justice Center Jail - East Side	Closed	Closed	251	252	275	280 281 280	279 281 280	0.3 0.4 0.2	208	56	0.96	26	47.0	Inactive	Inactive	Inactive
1062P-CAPI2761-Denver Justice Center Jail - East Side	Closed	Closed	231	230	257	279 280 279	280 280 280	0.7 0.5 0.7	191	54	0.95	26	45.0	Inactive	Inactive	Inactive
1083P-CAPI2759-DENVER CRIME LAB	Closed	Closed	83	83	92	281 283 281	281 283 281	0.0 0.2 0.1	70	13	0.97	21	39.0	Inactive	Inactive	Inactive
1084P-CAPI2760-DENVER CRIME LAB	Closed	Closed	82	84	92	281 282 282	281 282 281	0.2 0.2 1.1	70	10	0.97	17	41.0	Inactive	Inactive	Inactive
1085P-CAPI2761-DENVER CRIME LAB	Closed	Closed	77	79	86	281 282 281	281 282 281	0.1 0.2 0.1	66	10	0.95	18	41.0	Inactive	Inactive	Inactive

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Network Protector VAULTGARD

EATON

Critical: 45
Cautionary: 4
Controls: Remote

VaultGard Time:
01/14/2013 13:00:23 MST
Den Justice Center
☒ Enable 30 second auto-refresh

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Name: 1058P-CAPI2760-Denver Justice Center Courthouse - West Side
Address: A58

Configuration:

Status: Open
Reason: Normal
Operations: 22

- [View Setpoints](#)
- [View Trip Log](#)

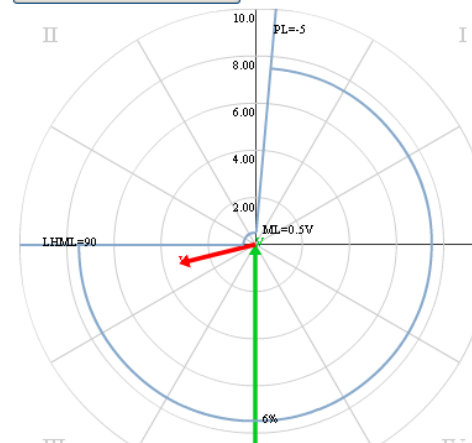
Actions:

Protective Close On ROBO On
Protective Close Off ROBO Off
Reset Pumping Fault

Firmware Version: 1.016
Breaker Position: Open
Remote Trip (ROBO): Inactive
Attempting Remote Protective Close: false

	A	B	C
Currents	0	0	0
Network Voltages (L-N)	283	282	282
Transformer Voltages (L-N)	282	280	280
Phasing Voltages	6.8	7.0	9.0

Pos Seq Phasing Voltage: 7.4
Pos Seq Phasing Angle: 104.0



Status

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Network Protector
VAULTGARD
EATON

Critical:	45
Cautionary:	4
Controls:	Remote

VaultGard Time:
 01/14/2013 13:02:17 MST
 Den Justice Center
☒ Enable 30 second auto-refresh

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Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
1057P-CAPI2759-Denver Justice Center Courthouse - West Side	Closed	Closed	202	227	277	282 282 282	282 282 282	0.1 0.2 0.1	189	-57	-0.95	18	46.0	Inactive	Inactive	Inactive
1058P-CAPI2760-Denver Justice Center Courthouse - West Side	Closed	Closed	203	225	280	282 281 281	282 280 280	0.1 0.6 0.5	191	-55	-0.95	23	46.0	Inactive	Inactive	Inactive
1059P-CAPI2761-Denver Justice Center Courthouse - West Side	Closed	Closed	197	219	267	282 281 281	282 281 280	0.4 0.1 0.3	185	-50	-0.97	19	44.0	Inactive	Inactive	Inactive
1060P-CAPI2759-Denver Justice Center Jail - East Side	Closed	Closed	240	248	267	280 280 278	280 280 278	0.1 0.2 0.0	200	58	0.95	29	46.0	Inactive	Inactive	Inactive
1061P-CAPI2760-Denver Justice Center Jail - East Side	Closed	Closed	252	252	280	281 281 280	280 280 279	0.3 0.4 0.2	210	54	0.96	26	46.0	Inactive	Inactive	Inactive
1062P-CAPI2761-Denver Justice Center Jail - East Side	Closed	Closed	244	249	278	280 281 278	280 280 279	0.7 0.5 0.7	204	58	0.95	26	44.0	Inactive	Inactive	Inactive
1083P-CAPI2759-DENVER CRIME LAB	Closed	Closed	76	77	83	282 282 281	282 282 281	0.0 0.2 0.1	63	14	0.96	21	38.0	Inactive	Inactive	Inactive
1084P-CAPI2760-DENVER CRIME LAB	Closed	Closed	74	77	83	281 282 282	280 282 280	0.2 0.2 1.3	63	10	0.97	17	41.0	Inactive	Inactive	Inactive
1085P-CAPI2761-DENVER CRIME LAB	Closed	Closed	75	75	81	280 282 281	280 282 281	0.1 0.2 0.1	62	12	0.97	18	41.0	Inactive	Inactive	Inactive

Status

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Bad Inline Limiters









Network Protector
VAULTGARD

EAT•N

Critical: 20
Cautionary: 0
Controls: Remote

VaultGard Time:
01/04/2013 14:16:24 MST
Market Parking
☒ Enable 30 second auto-refresh

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Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
907P-LACO1785-Market Parking 1412 Market	Closed	Closed	331	306	312	123 123 123	123 123 123	0.0 0.0 0.1	108	44	0.93	8	27.0	Inactive	Inactive	Inactive
910P-LACO1786-Market Parking 1412 Market	Closed	Closed	341	291	331	123 123 123	123 123 123	0.0 0.0 0.0	111	40	0.94	9	28.0	Inactive	Inactive	Inactive
1048P-LACO1784-MH 14-13-02	Closed	Closed	461	430	431	123 123 121	123 122 121	0.1 0.0 0.0	142	76	0.89	6	24.0	Inactive	Inactive	Inactive
464P-LACO1785-MH 14-13-06	Closed	Closed	465	373	458	122 122 122	122 122 122	0.0 0.0 0.0	147	58	0.93	5	27.0	Inactive	Inactive	Inactive
435P-LACO1784-MH 14-13-08	Closed	Closed	240	401	210	123 122 123	123 122 123	0.0 0.0 0.0	94	43	0.91	6	27.0	Inactive	Inactive	Inactive
1082P-LACO1786-MH 14-13-04	Closed	Closed	568	495	501	123 123 123	123 123 123	0.1 0.0 0.0	168	94	0.87	7	30.0	Inactive	Inactive	Inactive

Address/Name

Status

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Network Protector VAULTGARD

EATON

Critical: 20
Cautionary: 0
Controls: Remote

VaultGard Time:
01/04/2013 14:16:50 MST
Market Parking
☒ Enable 30 second auto-refresh

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 - Software Licenses

Name: 435P-LACO1784-MH 14-13-08
Address: 435

Configuration:

Status: Closed
Reason: Normal
Operations: 6

- [View Setpoints](#)
- [View Trip Log](#)

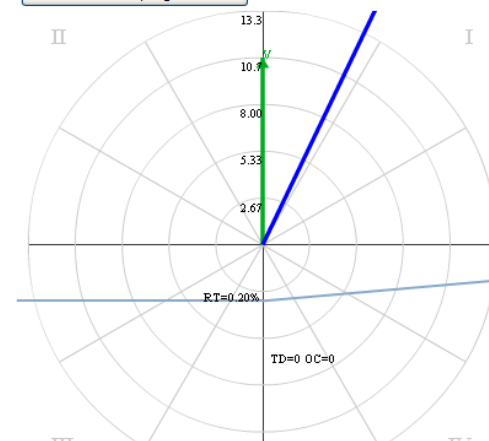
Actions:

Protective Close On ROBO On
Protective Close Off ROBO Off
Reset Pumping Fault

Firmware Version 1.017
Breaker Position Closed
Remote Trip (ROBO) Inactive
Attempting Remote Protective Close false

	A	B	C
Currents	237	419	210
Network Voltages(L-N)	123	122	123
Transformer Voltages (L-N)	123	122	123
Phasing Voltages	0.0	0.0	0.0

Pos Seq Phasing Voltage 0.0
Pos Seq Phasing Angle 0.0



Status

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Time Delay and Over Current Sensitive Trip



**Network Protector**
VAULTGARD

EAT•N

Critical:	0
Cautionary:	34
Controls:	Remote

VaultGard Time:
01/04/2013 14:23:39 MST
United Bank Complex
☒ Enable 30 second auto-refresh

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2012-04-10 02:50:11	2012-04-10 02:50:00	12	Reversed phase on transformer side or rolled phase on transformer or network side or V1p > .06 pu
2012-04-10 02:50:12	2012-04-10 02:50:00	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-10 06:32:59	2012-04-10 06:32:52	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-10 06:33:00	2012-04-10 06:32:53	12	Reversed phase on transformer side or rolled phase on transformer or network side or V1p > .06 pu
2012-04-10 06:33:00	2012-04-10 06:32:54	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-12 22:16:56	2012-04-12 22:16:49	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-14 00:12:00	2012-04-14 00:11:57	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-18 01:40:02	2012-04-18 01:39:55	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-18 01:40:02	2012-04-18 01:39:57	12	Reversed phase on transformer side or rolled phase on transformer or network side or V1p > .06 pu
2012-04-18 01:40:03	2012-04-18 01:39:57	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-18 06:29:57	2012-04-18 06:29:52	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-19 21:28:59	2012-04-19 21:28:52	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-21 00:20:14	2012-04-21 00:20:10	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-23 01:49:38	2012-04-23 01:49:36	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-23 06:01:20	2012-04-23 06:01:12	256	Remote Open Block Open (ROBO)
2012-04-23 06:54:59	2012-04-23 06:54:58	16	Time delayed sensitive trip
2012-04-24 01:37:04	2012-04-24 01:37:03	16	Time delayed sensitive trip
2012-04-24 07:09:45	2012-04-24 07:09:43	16	Time delayed sensitive trip
2012-07-25 08:13:36	2012-07-25 08:13:37	16	Time delayed sensitive trip
2012-07-25 12:47:24	2012-07-25 12:47:23	16	Time delayed sensitive trip
2012-08-13 11:05:04	2012-08-13 11:05:01	256	Remote Open Block Open (ROBO)

Status

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Done

Local intranet100%





Network Protector VAULTGARD

EATON

Critical: 0
Cautionary: 34
Controls: Remote

VaultGard Time:
01/04/2013 14:25:15 MST
United Bank Complex
☒ Enable 30 second auto-refresh

- Data View
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 - Software Licenses

2012-04-19 01:54:09	2012-04-19 01:54:08	12	Reversed phase on transformer side or rolled phase on transformer or network side or V1p > .06 pu
2012-04-19 01:54:09	2012-04-19 01:54:08	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-19 06:13:54	2012-04-19 06:13:51	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-20 01:24:46	2012-04-20 01:24:44	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-20 06:23:40	2012-04-20 06:23:37	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-21 00:20:15	2012-04-21 00:20:11	8	Sensitive Trip (sensitive or watt-var mode)
2012-04-23 05:58:05	2012-04-23 05:57:59	256	Remote Open Block Open (ROBO)
2012-04-26 01:48:31	2012-04-26 01:48:30	16	Time delayed sensitive trip
2012-04-26 06:31:41	2012-04-26 06:31:37	16	Time delayed sensitive trip
2012-07-23 08:50:22	2012-07-23 08:50:19	16	Time delayed sensitive trip
2012-07-23 13:17:02	2012-07-23 13:17:05	16	Time delayed sensitive trip
2012-07-23 13:17:57	2012-07-23 13:17:55	16	Time delayed sensitive trip
2012-07-24 08:26:36	2012-07-24 08:26:37	16	Time delayed sensitive trip
2012-07-24 13:08:47	2012-07-24 13:08:45	16	Time delayed sensitive trip
2012-08-13 11:08:22	2012-08-13 11:08:23	256	Remote Open Block Open (ROBO)
2012-09-03 16:48:59	2012-09-03 16:48:56	1024	Overcurrent trip (time delayed or insensitive mode) (ALARM)
2012-09-03 18:03:49	2012-09-03 18:03:49	1024	Overcurrent trip (time delayed or insensitive mode) (ALARM)
2012-09-15 22:37:58	2012-09-15 22:37:59	16	Time delayed sensitive trip
2012-09-15 22:37:59	2012-09-15 22:38:00	1028	Reversed phase on transformer side or rolled phase on transformer or network side or V1p > .06 pu
2012-09-15 22:37:59	2012-09-15 22:38:00	1024	Overcurrent trip (time delayed or insensitive mode) (ALARM)
2012-09-26 08:02:34	2012-09-26 08:02:29	256	Remote Open Block Open (ROBO)

Status

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Miss-Matched Transformer Impedance









Network Protector
VAULTGARD

EATON

Critical: 12
Cautionary: 6
Controls: Remote

VaultGard Time:
01/14/2013 08:57:52 MST
Adams Mark Hotel
☒ Enable 30 second auto-refresh

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- Field Bus Configuration
 - ☒ INCOM
 - ☒ DNP
- Documentation
 - Eaton Website
 - Eaton Network Protector
 - Software Licenses

Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
927P-ELAT1097- Adams Mark Hotel - South Bank	Closed	Closed	318	328	343	284 285 285	285 285 285	0.2 0.2 0.1	252	124	0.89	25	12.0	Inactive	Inactive	Inactive
928P-ELAT1096- Adams Mark Hotel - South Bank	Closed	Closed	304	325	339	284 286 285	284 286 285	0.1 0.1 0.4	247	121	0.90	17	10.0	Inactive	Inactive	Inactive
929P-ELAT1098- Adams Mark Hotel - South Bank	Closed	Closed	437	451	473	284 286 284	284 286 284	0.0 0.1 0.1	355	156	0.91	14	13.0	Inactive	Inactive	Inactive
941P-ELAT1098- Adams Mark Hotel - North Bank	Closed	Closed	112	106	117	286 287 286	286 287 287	0.2 0.1 0.2	80	52	0.83	13	12.0	Inactive	Inactive	Inactive
943P-ELAT1096- Adams Mark Hotel - North Bank	Closed	Closed	110	119	125	285 287 287	286 287 287	0.2 0.1 0.1	85	54	0.84	18	11.0	Inactive	Inactive	Inactive
945P-ELAT1097- Adams Mark Hotel - North Bank	Closed	Closed	113	107	124	286 287 287	286 287 287	0.1 0.2 0.2	83	50	0.85	16	13.0	Inactive	Inactive	Inactive

Address/Name

Status

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Transformer With Incorrect Tap Changer From the Manufacturer











Network Protector
VAULTGARD

EATON


Critical: 14
Cautionary: 8
Controls: Remote

VaultGard Time:
01/14/2013 09:22:15 MST
One Lincoln Park
☒ Enable 30 second auto-refresh

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 - Eaton Website

Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
1044P - CALI1834 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Closed	Closed	244	263	281	286 288 286	286 288 286	0.1 0.0 0.1	155	-163	-0.69	7	23.0	Inactive	Inactive	Inactive
1045P - CALI1835 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Closed	Closed	237	267	250	284 286 285	284 286 285	0.1 0.0 0.1	163	-137	-0.76	13	23.0	Inactive	Inactive	Inactive
1046P - CALI1836 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Closed	Closed	614	637	658	287 288 285	287 288 285	0.1 0.0 0.1	240	491	0.44	19	22.0	Inactive	Inactive	Inactive

Address/Name



Network Protector
VAULTGUARD

EAT•N

Critical:
14

Cautionary:
8

Controls:
Remote

VaultGuard Time:
 01/14/2013 09:23:05 MST
 One Lincoln Park
☒ Enable 30 second auto-refresh

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Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
1044P - CALI1834 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Open	Open	0	0	0	288 289 287	285 287 284	4.0 4.4 4.9	0	0	1.00	7	23.0	Inactive	Inactive	Inactive
1045P - CALI1835 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Closed	Closed	356	403	404	286 287 285	286 287 285	0.1 0.0 0.1	246	-222	-0.74	13	23.0	Inactive	Inactive	Inactive
1046P - CALI1836 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Closed	Closed	585	617	638	288 289 286	287 289 286	0.1 0.0 0.1	334	409	0.63	19	23.0	Inactive	Inactive	Inactive

Address/Name

Status
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Network Protector VAULTGARD

EATON

Critical: 14
Cautionary: 8
Controls: Remote

VaultGard Time:
01/14/2013 09:23:26 MST
One Lincoln Park
☒ Enable 30 second auto-refresh

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 - Software Licenses

Name: 1045P - CALI1835 - One Lincoln Park - 2001 Linc. - Sidewlk Bsmnt
Address: A45

Status: Closed
Reason: Normal
Operations: 13

Firmware Version: 1.016
Breaker Position: Closed
Remote Trip (ROBO): Inactive
Attempting Remote Protective Close: false

	A	B	C
Currents	369	417	417
Network Voltages (L-N)	286	287	286
Transformer Voltages (L-N)	286	287	286
Phasing Voltages	0.1	0.0	0.1

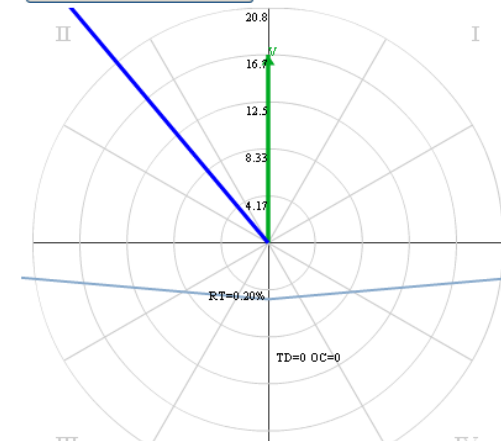
Pos Seq Phasing Voltage: 0.1
Pos Seq Phasing Angle: 180.0

Configuration:

- [View Setpoints](#)
- [View Trip Log](#)

Actions:

Protective Close On ROBO On
Protective Close Off ROBO Off
Reset Pumping Fault



Status

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Network Protector
VAULTGARD

EAT•N

Critical:	14
Cautionary:	8
Controls:	Remote

VaultGard Time:
 01/14/2013 09:24:12 MST
 One Lincoln Park
☒ Enable 30 second auto-refresh

- Data View
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 - Eaton Network Protector
 - Software Licenses

Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
1044P - CALI1834 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Open	Open	0	0	0	290 290 290	285 286 285	8.0 9.0 9.7	0	0	1.00	7	23.0	Inactive	Inactive	Inactive
1045P - CALI1835 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Open	Open	0	0	0	288 290 287	283 285 282	7.7 8.7 8.8	0	0	1.00	13	23.0	Inactive	Inactive	Inactive
1046P - CALI1836 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Closed	Closed	634	746	800	287 289 287	287 289 287	0.1 0.0 0.1	604	173	0.96	19	22.0	Inactive	Inactive	Inactive

Address/Name

Status
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Network Protector VAULTGARD

EAT•N

Critical: 14
Cautionary: 8
Controls: Remote

VaultGard Time:
01/14/2013 09:24:31 MST
One Lincoln Park
☒ Enable 30 second auto-refresh

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 - Software Licenses

Name: 1045P - CALI1835 - One Lincoln Park - 2001 Linc. - Sidewlk Bsmnt
Address: A45

Status: Open
Reason: Normal
Operations: 13

Firmware Version: 1.016
Breaker Position: Open
Remote Trip (ROBO): Inactive
Attempting Remote Protective Close: false

	A	B	C
Currents	0	0	0
Network Voltages (L-N)	289	289	288
Transformer Voltages (L-N)	284	284	284
Phasing Voltages	8.1	9.0	9.1

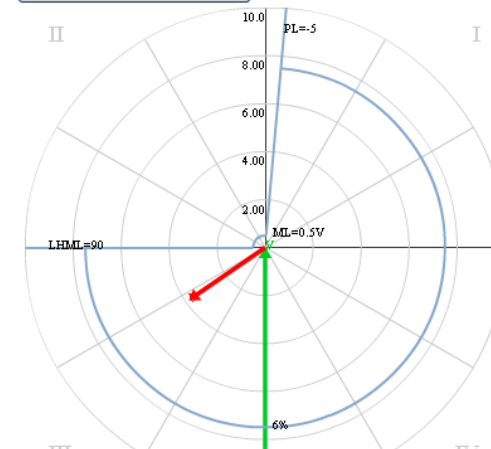
Pos Seq Phasing Voltage: 8.6
Pos Seq Phasing Angle: 124.6

Configuration:

- [View Setpoints](#)
- [View Trip Log](#)

Actions:

Protective Close On ROBO On
Protective Close Off ROBO Off
Reset Pumping Fault



Status

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Network Protector VAULTGARD

EATON

Critical: 14
Cautionary: 8
Controls: Remote

VaultGard Time:
01/14/2013 09:26:12 MST
One Lincoln Park
☒ Enable 30 second auto-refresh

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Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
1044P - CALI1834 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Closed	Closed	290	332	351	285 284 284	285 284 284	0.1 0.0 0.1	267	66	0.97	8	23.0	Inactive	Inactive	Inactive
1045P - CALI1835 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Closed	Closed	288	350	383	283 283 282	283 283 282	0.1 0.0 0.1	273	95	0.94	14	23.0	Inactive	Inactive	Inactive
1046P - CALI1836 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Open	Open	0	0	0	284 285 282	293 295 292	9.8 10.2 10.9	0	0	1.00	19	22.0	Inactive	Inactive	Inactive

Address/Name

Status

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Network Protector VAULTGARD

EAT•N

Critical: 14
Cautionary: 8
Controls: Remote

VaultGard Time:
01/14/2013 09:26:35 MST
One Lincoln Park
☒ Enable 30 second auto-refresh

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Name: 1046P - CALI1836 - One Lincoln Park - 2001 Linc. - Sidewlk Bsmnt
Address: A46

Configuration:

Status: Open
Reason: Normal
Operations: 19

- [View Setpoints](#)
- [View Trip Log](#)

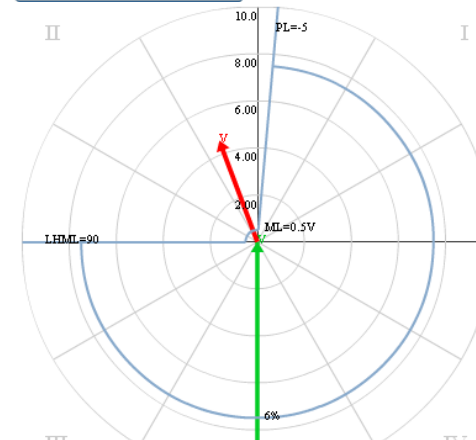
Actions:

Protective Close On ROBO On
Protective Close Off ROBO Off
Reset Pumping Fault

Firmware Version: 1.014
Breaker Position: Open
Remote Trip (ROBO): Inactive
Attempting Remote Protective Close: false

	A	B	C
Currents	0	0	0
Network Voltages (L-N)	283	285	282
Transformer Voltages (L-N)	292	294	292
Phasing Voltages	9.7	10.1	10.9

Pos Seq Phasing Voltage: 10.3
Pos Seq Phasing Angle: 20.6



Status

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Network Protector
VAULTGARD

EATON

Critical: 14
Cautionary: 8
Controls: Remote

VaultGard Time:
01/14/2013 09:10:07 MST
One Lincoln Park
☒ Enable 30 second auto-refresh

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 - Software Licenses

Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _I (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
1044P - CALI1834 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Closed	Closed	210	232	238	284 285 284	284 285 284	0.1 0.0 0.1	188	42	0.97	7	23.0	Inactive	Inactive	Inactive
1045P - CALI1835 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Closed	Closed	209	249	264	282 283 282	282 283 282	0.1 0.0 0.1	193	64	0.95	13	23.0	Inactive	Inactive	Inactive
1046P - CALI1836 - One Lincoln Park -2001 Linc. - Sidewlk Bsmnt	Closed	Closed	215	250	272	284 285 283	284 285 283	0.1 0.0 0.1	201	54	0.97	18	22.0	Inactive	Inactive	Inactive

Address/Name

Status

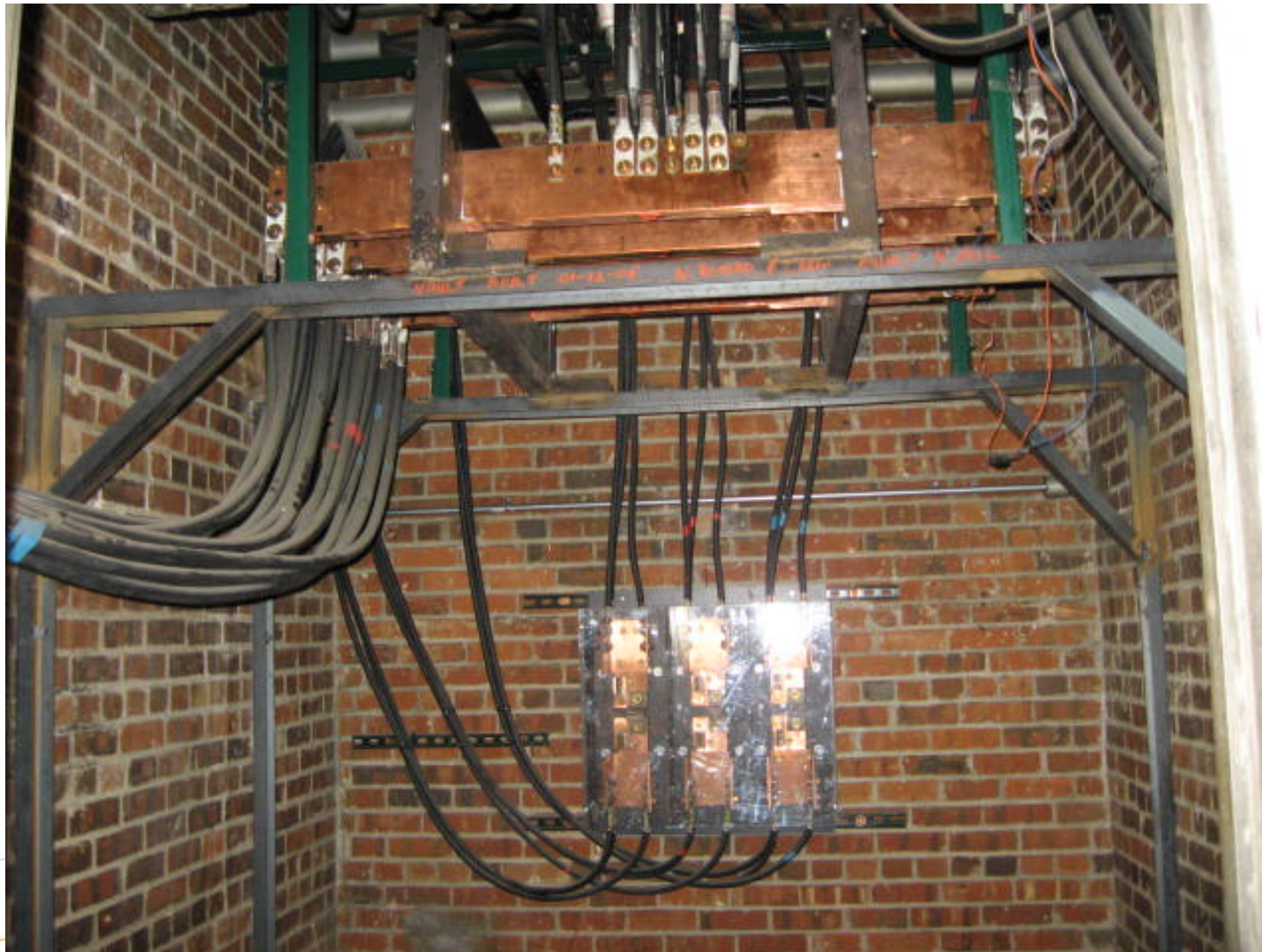
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Bad Transformer











Network Protector VAULTGARD

EATON

Critical: 25
Cautionary: 15
Controls: Remote

VaultGard Time:
01/14/2013 10:14:22 MST
Denver Club Bsmnt
☒ Enable 30 second auto-refresh

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 - Software Licenses

Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
174P - DTER1304 - Denver Club - 518 17th Basement	Closed	Closed	407	438	411	124 125 123	124 125 123	0.1 0.0 0.1	152	16	0.99	9	13.0	Inactive	Inactive	Inactive
176P - DTER1305 - Denver Club - 518 17th Basement	Closed	Closed	418	474	433	124 124 124	124 124 124	0.0 0.0 0.1	162	20	0.98	4	10.0	Inactive	Inactive	Inactive
177P - DTER1306 - Denver Club - 518 17th Basement	Closed	Closed	400	425	393	124 124 124	124 124 124	0.2 0.0 0.1	150	14	0.99	4	8.0	Inactive	Inactive	Inactive
975P - DTER1306 - Paramount Theater	Closed	Closed	126	172	273	124 124 124	124 124 124	0.1 0.0 0.0	65	27	0.92	15	14.0	Inactive	Inactive	Inactive
1043P - DTER1304 - Paramount Theater	Closed	Closed	121	143	23	124 124 123	124 124 123	0.0 0.0 0.0	33	13	0.90	10	14.0	Inactive	Inactive	Inactive

Address/Name

Status

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Network Protector VAULTGARD

EAT•N

Critical: 25
Cautionary: 15
Controls: Remote

VaultGard Time:
01/14/2013 10:15:55 MST
Denver Club Bsmnt
☒ Enable 30 second auto-refresh

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 - ☒ DNP
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 - Software Licenses

Name: 1043P - DTER1304 - Paramount Theater
Address: A43

Status: Closed
Reason: Normal
Operations: 10

Firmware Version: 1.016
Breaker Position: Closed
Remote Trip (ROBO): Inactive
Attempting Remote Protective Close: false

	A	B	C
Currents	279	325	285
Network Voltages (L-N)	123	124	109
Transformer Voltages (L-N)	123	124	109
Phasing Voltages	0.0	0.0	0.0

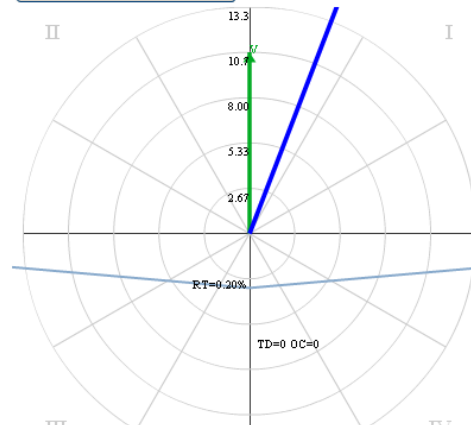
Pos Seq Phasing Voltage: 0.0
Pos Seq Phasing Angle: 0.0

Configuration:

- [View Setpoints](#)
- [View Trip Log](#)

Actions:

Protective Close On ROBO On
Protective Close Off ROBO Off
Reset Pumping Fault



Status

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Network Protector
VAULTGARD

EATON

Critical: 25
Cautionary: 15
Controls: Remote

VaultGard Time:
01/14/2013 10:15:42 MST
Denver Club Bsmnt
☒ Enable 30 second auto-refresh

- Data View
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Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
174P - DTER1304 - Denver Club - 518 17th Basement	Closed	Closed	410	440	408	124 124 124	124 124 124	0.1 0.0 0.1	154	15	0.99	9	13.0	Inactive	Inactive	Inactive
176P - DTER1305 - Denver Club - 518 17th Basement	Closed	Closed	427	480	430	123 124 124	123 124 124	0.0 0.0 0.1	163	20	0.99	4	10.0	Inactive	Inactive	Inactive
177P - DTER1306 - Denver Club - 518 17th Basement	Closed	Closed	406	428	399	124 124 124	124 124 124	0.2 0.0 0.1	151	15	0.99	4	8.0	Inactive	Inactive	Inactive
975P - DTER1306 - Paramount Theater	Open	Open	0	0	0	123 124 108	124 125 125	1.7 2.0 19.9	0	0	1.00	15	14.0	Inactive	Inactive	Inactive
1043P - DTER1304 - Paramount Theater	Closed	Closed	278	337	291	123 124 108	123 124 108	0.0 0.0 0.0	100	40	0.92	10	15.0	Inactive	Inactive	Inactive

Address/Name

Status

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Network Protector
VAULTGARD



Critical: 25
Cautionary: 15
Controls: Remote

VaultGard Time:
01/14/2013 10:17:34 MST
Denver Club Bsmnt
☒ Enable 30 second auto-refresh

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Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
174P - DTER1304 - Denver Club - 518 17th Basement	Closed	Closed	402	422	398	124 125 124	124 125 124	0.1 0.0 0.1	149	14	0.99	9	13.0	Inactive	Inactive	Inactive
176P - DTER1305 - Denver Club - 518 17th Basement	Closed	Closed	415	464	423	123 124 124	123 124 124	0.0 0.0 0.1	159	15	0.99	4	10.0	Inactive	Inactive	Inactive
177P - DTER1306 - Denver Club - 518 17th Basement	Closed	Closed	394	409	382	124 125 124	124 125 124	0.2 0.0 0.1	146	12	0.99	4	8.0	Inactive	Inactive	Inactive
975P - DTER1306 - Paramount Theater	Closed	Closed	264	308	305	123 124 123	123 124 123	0.1 0.0 0.0	99	43	0.92	16	15.0	Inactive	Inactive	Inactive
1043P - DTER1304 - Paramount Theater	Open	Open	0	0	0	123 124 124	124 125 124	1.6 1.7 1.4	0	0	1.00	10	14.0	Inactive	Inactive	Inactive

Address/Name



Bad “B” Contact





Network Protector

VAULTGUARD

EAT•N

Critical: 32

Cautionary: 4

Controls: Remote

VaultGuard Time:
01/15/2013 08:25:03 MST
Brooks Tower Parking
☒ Enable 30 second auto-refresh

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Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
111P-LACO1788-Brooks Tower Parking	Closed	Closed	170	177	172	277 279 278	277 279 278	0.4 0.1 0.1	125	71	0.87	25	26.0	Inactive	Inactive	Inactive
298P-LACO1789-Brooks Tower Parking	Closed	Closed	188	174	177	278 278 278	278 278 278	0.0 0.0 0.0	129	76	0.85	19	30.0	Inactive	Inactive	Inactive
300P-LACO1787-Brooks Tower Parking	Closed	Closed	204	215	206	278 278 279	278 278 279	0.0 0.0 0.0	140	102	0.81	26	33.0	Inactive	Inactive	Inactive
295P LACO 1788 - Executive Towers	Closed	Closed	812	759	790	276 278 277	276 278 277	0.3 0.1 0.5	644	105	0.99	21	27.0	Inactive	Inactive	Inactive
296P LACO 1789 - Executive Towers	Closed	Closed	802	754	786	277 280 277	277 280 277	0.1 0.3 0.1	642	112	0.99	18	29.0	Inactive	Inactive	Inactive
297P LACO 1787 - Executive Towers	Open	Open	792	761	777	276 279 277	276 279 277	0.2 0.2 0.0	637	96	0.99	23	28.0	Inactive	Inactive	Inactive

Address/Name

Status
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Network Protector VAULTGARD

EATON

Critical: 30
Cautionary: 9
Controls: Remote

VaultGard Time:
01/11/2013 08:01:50 MST
1st InterSt 18th&Cal
☒ Enable 30 second auto-refresh

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Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
337P - CALI1836 - 1st Interstate Plaza - 18th and Cali - Bsmnt	Closed	Closed	287	285	283	281 281 280	281 281 280	0.2 0.1 0.0	208	119	0.87	4	42.0	Inactive	Inactive	Inactive
338P - CALI1835 - 1st Interstate Plaza - 18th and Cali - Bsmnt	Closed	Closed	292	286	286	280 282 280	280 281 280	0.3 0.1 0.0	207	125	0.85	3	43.0	Inactive	Inactive	Inactive
339P - CALI1834 - 1st Interstate Plaza - 18th and Cali - Bsmnt	Closed	Closed	265	255	264	333 330 334	333 330 334	0.1 0.1 0.1	190	108	0.73	1	43.0	Inactive	Inactive	Inactive
340P - CALI1836 - 1st Interstate Plaza - 18th and Cali - Bsmnt	Closed	Closed	400	136	424	280 281 280	280 281 280	0.3 0.2 0.2	185	45	0.69	5	44.0	Inactive	Inactive	Inactive
341P - CALI1834 - 1st Interstate Plaza - 18th and Cali - Bsmnt	Closed	Closed	390	428	412	281 279 279	281 279 279	0.1 0.2 0.2	330	71	0.96	1	44.0	Inactive	Inactive	Inactive
342P - CALI1835 - 1st Interstate Plaza - 18th and Cali - Bsmnt	Alarmed	Open	0	0	0	280 281 279	282 282 280	3.8 4.5 4.2	0	0	1.00	2	45.0	Inactive	Inactive	Inactive

Address/Name

Status

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Network Protector
VAULTGARD

EATON

Critical: 12
Cautionary: 0
Controls: Remote

VaultGard Time:
01/18/2013 03:06:31 MST
Brooks Tower Parking
☒ Enable 30 second auto-refresh


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Name	Status	Breaker Pos	I _A	I _B	I _C	V _N (A) (B) (C)	V _T (A) (B) (C)	V _P (A) (B) (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
111P-LACO1788-Brooks Tower Parking	Closed	Closed	165	165	169	279 279 279	278 279 279	0.4 0.1 0.1	120	70	0.86	25	34.0	Inactive	Inactive	Inactive
298P-LACO1789-Brooks Tower Parking	Closed	Closed	181	163	171	279 280 280	279 280 280	0.0 0.0 0.0	121	76	0.84	19	38.0	Inactive	Inactive	Inactive
300P-LACO1787-Brooks Tower Parking	Closed	Closed	166	166	168	278 280 279	278 280 279	0.0 0.0 0.0	119	74	0.85	26	40.0	Inactive	Inactive	Inactive
295P LACO 1788 - Executive Towers	Closed	Closed	536	479	533	278 279 278	278 279 277	0.4 0.1 0.6	419	95	0.98	21	33.0	Inactive	Inactive	Inactive
296P LACO 1789 - Executive Towers	Closed	Closed	527	470	520	279 279 278	279 279 278	0.1 0.3 0.1	409	109	0.97	18	34.0	Inactive	Inactive	Inactive
297P LACO 1787 - Executive Towers	Closed	Closed	518	468	510	278 280 279	278 280 279	0.2 0.2 0.1	404	100	0.97	25	34.0	Inactive	Inactive	Inactive

Address/Name

Status

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Vault Installations
Negative Power Factor
Bad In-Line Limiters
Time Delay and Over Current Sensitive Trip
Miss-Matched Impedance
Transformer With Incorrect Tap Changer
Bad Transformer
Bad “B” Contact

