Eaton Vaultgard Users Group

For Engineers and Field Personnel

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Presentation Overview

- Denver Network Stats
- Vaultgard Overview
- Real Time Data
- Troubleshooting with Vaultgard
- Potential Return
- Phasing Verification
- Instantaneous Alarm Alerts
- Troubleshooting
- Network Rerouting
- Fault Locating Using Vaultgard

Denver Network Stats

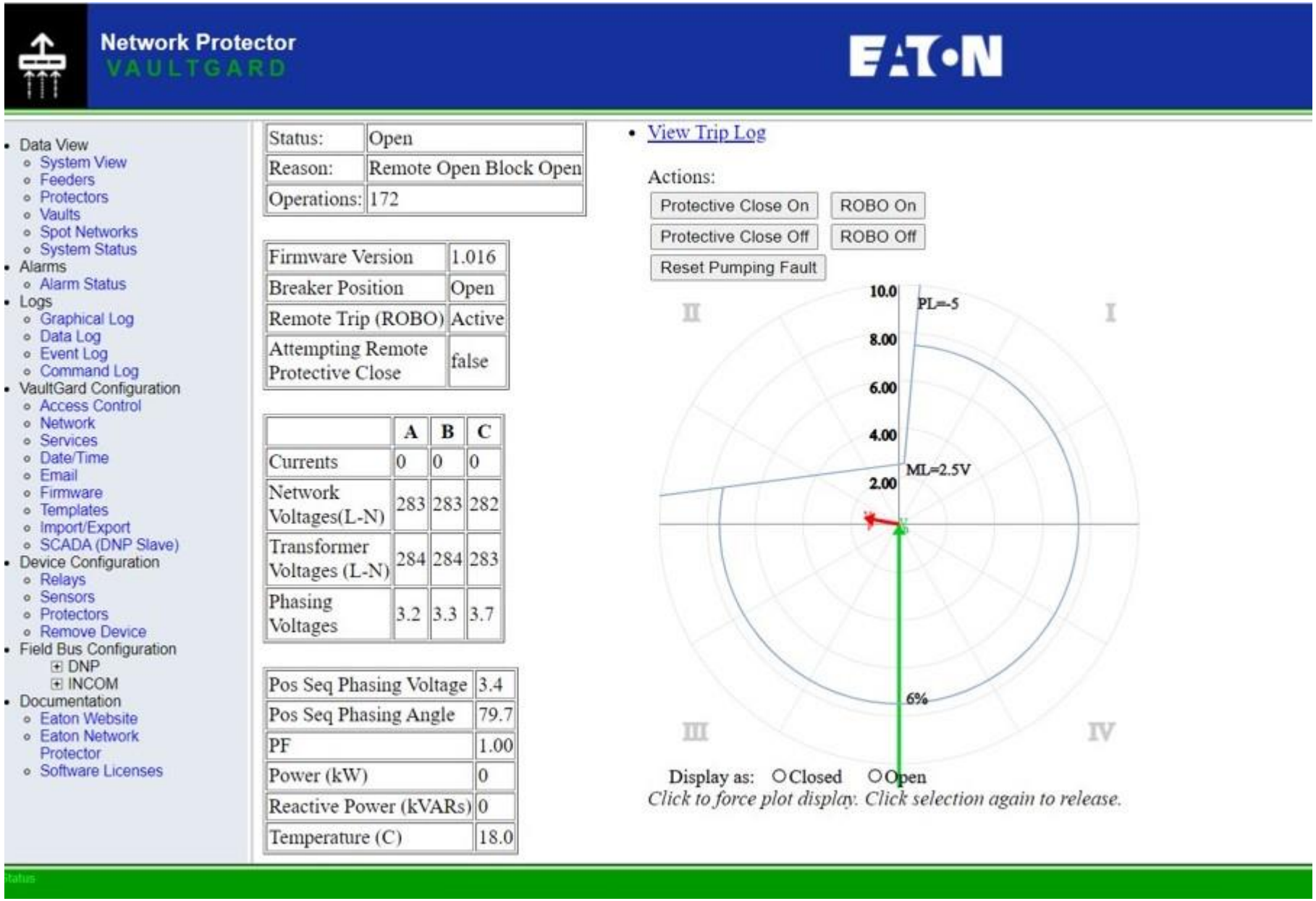
- Vaultgards
  - ➢127
- Protectors
  - ➢812
- Networks
  - ➢13 – 3 Feeder
- Substations
  - ➢5

Vaultgard Overview

Vaultgard

Eaton’s VaultGard network communications platform is the most advanced network communications system on the market. The features and adaptations allow for the most comprehensive monitoring system for the underground network vault. In addition, it is compatible with Eaton’s transformer monitoring system that provides real-time and predictive analysis of transformer health and status.

Predictive Maintenance

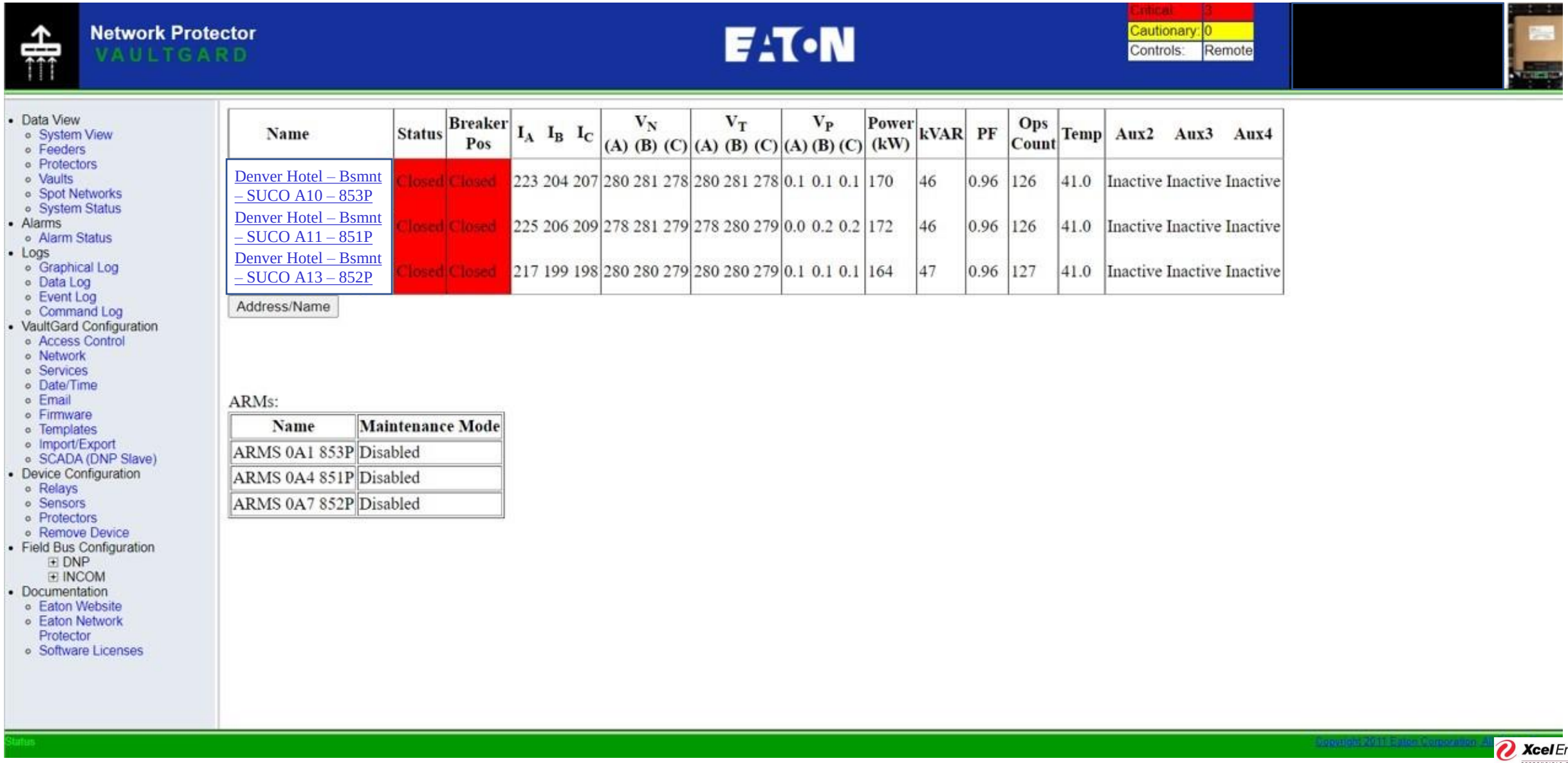


Eaton's VaultGard communications platform brings a wealth of information from the utility vault to utility personnel in a user-friendly web interface or into existing SCADA. Information contained in VaultGard can be trended and analyzed different ways to determine predictive maintenance schedules.

Improved Network Safety

Through Eaton’s VaultGard communications platform, network protectors can be opened, and safety features activated remotely, mitigating potential danger to the operator before they enter the vault.

Real Time Information



Network Protector
VAULTGARD

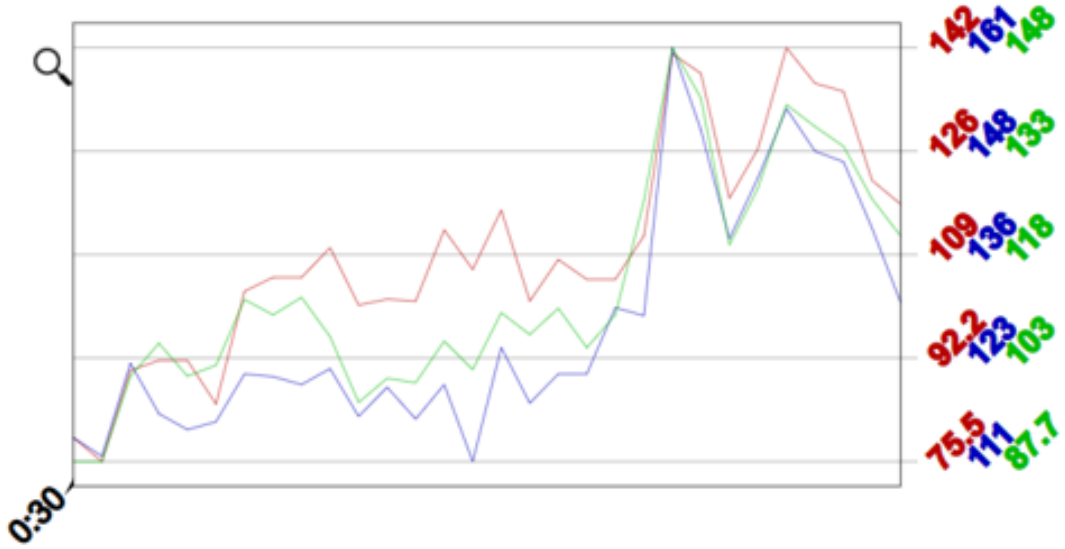
EATON

Vaultgard Graphical View

- Data View
  - System View
  - Feeders
  - Protectors
  - Vaults
  - Spot Networks
  - System Status
- Alarms
  - Alarm Status
- Logs
  - Graphical Log
  - Data Log
  - Event Log
  - Command Log
- VaultGard Configuration
  - Access Control
  - Network
  - Services
  - Date/Time
  - Email
  - Firmware
  - Templates
  - Import/Export
  - SCADA (DNP Slave)
- Device Configuration
  - Relays
  - Sensors
  - Protectors
  - Remove Device
- Field Bus Configuration
  - DNP
  - INCOM
- Documentation
  - Eaton Website
  - Eaton Network Protector
  - Software Licenses

Interval Graphs

Success.



From Date: 03/08/2023 12:30 am

To Date: 03/08/2023 12:59 am

Log Extent: 283 days, 1 hrs

Plot Selection: Dominion Plaza - 30th Fl - Bank 2 - CAPI 2759 - 708P | IC

Add

Device	Value	Color
/INCOM/Network/708	IA	
/INCOM/Network/708	IB	

Status

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

View Log Data | Download to CSV

Show 10 entries

Time	IA	IB	IC	Power (W)	VAR	PF	# Breaker Ops	Temp	VT A	VT B	VT C
03-01-2023 00:00:00	88.32	81.92	104.63	72910	26669	0.927	160	31	290.5	291.5	290.1
03-01-2023 00:01:00	90.56	84.8	107.51	74860	27041	0.914	160	30	290.1	291.8	290.5
03-01-2023 00:02:00	98.55	95.04	116.15	83130	26901	0.923	160	31	290.2	290.9	289.6
03-01-2023 00:03:00	101.11	96.96	117.43	85000	27208	0.926	160	31	289.7	291.9	290.6
03-01-2023 00:04:00	90.88	84.16	106.55	75080	26012	0.917	160	31	291.6	291	290.2
03-01-2023 00:05:00	89.28	84.48	105.59	74070	26931	0.923	160	31	290.1	292.2	289.8
03-01-2023 00:06:00	89.92	84.16	105.59	73660	27548	0.918	160	31	289.7	292	290.5
03-01-2023 00:07:00	86.72	82.56	102.71	71810	25919	0.913	160	31	291.6	291.4	290.3
03-01-2023 00:08:00	88.64	83.2	103.03	72970	26143	0.909	160	31	290.8	291.6	290.1
03-01-2023 00:09:00	126.39	122.87	144.31	108750	28987	0.948	160	31	290.1	291.9	289.8

Showing 1 to 10 of 1,441 entries

First Previous 1 2 3 4 5 Next Last

N13

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Time	IA	IB	IC	Power (W)	VAR	PF	# Breaker C	Temp	VT A	VT B	VT C	
2	3/1/2023 0:00	88.32	81.92	104.63	72910	26669	0.927	160	31	290.5	291.5	290.1	
3	3/1/2023 0:01	90.56	84.8	107.51	74860	27041	0.914	160	30	290.1	291.8	290.5	
4	3/1/2023 0:02	98.55	95.04	116.15	83130	26901	0.923	160	31	290.2	290.9	289.6	
5	3/1/2023 0:03	101.11	96.96	117.43	85000	27208	0.926	160	31	289.7	291.9	290.6	
6	3/1/2023 0:04	90.88	84.16	106.55	75080	26012	0.917	160	31	291.6	291	290.2	
7	3/1/2023 0:05	89.28	84.48	105.59	74070	26931	0.923	160	31	290.1	292.2	289.8	
8	3/1/2023 0:06	89.92	84.16	105.59	73660	27548	0.918	160	31	289.7	292	290.5	
9	3/1/2023 0:07	86.72	82.56	102.71	71810	25919	0.913	160	31	291.6	291.4	290.3	
10	3/1/2023 0:08	88.64	83.2	103.03	72970	26143	0.909	160	31	290.8	291.6	290.1	
11	3/1/2023 0:09	126.39	122.87	144.31	108750	28987	0.948	160	31	290.1	291.9	289.8	
12	3/1/2023 0:10	106.87	103.67	125.11	91630	26782	0.948	160	30	290.5	292.2	289.7	
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													

download (22)

Ready

Vaultgard Event Logs

Events Log

I29 | 300.2 (High Cautionary Limit Exceeded)

	A	B	C	D	E	F	G	H	I	J	K
1	Index	Event ID	Date	Time	Time(secor	Path	Device Display Name	Parameter Display Na	Value	Condition Active	
2	1	5419	7-Dec-21	0:36	39.13996	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	300.1 (High Cautionary Limit Exceeded)	Active	
3	2	5422	7-Dec-21	0:36	42.26829	/INCOM/Network/A92/mACTransVAN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Van	300.3 (High Cautionary Limit Exceeded)	Active	
4	3	5419	7-Dec-21	0:36	42.26829	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	299.7 (High Cautionary Limit Exceeded)	Cleared	
5	4	5422	7-Dec-21	0:36	45.3699	/INCOM/Network/A92/mACTransVAN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Van	299.5 (High Cautionary Limit Exceeded)	Cleared	
6	5	5419	7-Dec-21	0:36	48.54281	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	300.5 (High Cautionary Limit Exceeded)	Active	
7	6	5419	7-Dec-21	0:36	54.78851	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	299.4 (High Cautionary Limit Exceeded)	Cleared	
8	7	5420	7-Dec-21	0:37	2.252025	/INCOM/Network/A97/mACTransVBN/Value	*440 14Th St - DTER 1306(TEMP 2761) - 1097P	Transformer Vbn	300.2 (High Cautionary Limit Exceeded)	Active	
9	8	5419	7-Dec-21	0:37	4.205844	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	300.5 (High Cautionary Limit Exceeded)	Active	
10	9	5420	7-Dec-21	0:37	5.465604	/INCOM/Network/A97/mACTransVBN/Value	*440 14Th St - DTER 1306(TEMP 2761) - 1097P	Transformer Vbn	298.5 (High Cautionary Limit Exceeded)	Cleared	
11	10	5419	7-Dec-21	0:37	7.472959	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	299.3 (High Cautionary Limit Exceeded)	Cleared	
12	11	5419	7-Dec-21	0:37	16.90295	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	300.6 (High Cautionary Limit Exceeded)	Active	
13	12	5419	7-Dec-21	0:37	29.50883	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	299.6 (High Cautionary Limit Exceeded)	Cleared	
14	13	5419	7-Dec-21	0:37	42.22228	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	300.9 (High Cautionary Limit Exceeded)	Active	
15	14	5419	7-Dec-21	0:37	48.45489	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	300 (High Cautionary Limit Exceeded)	Cleared	
16	15	5419	7-Dec-21	0:37	51.57061	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	300.2 (High Cautionary Limit Exceeded)	Active	
17	16	5419	7-Dec-21	0:37	54.6929	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	299.3 (High Cautionary Limit Exceeded)	Cleared	
18	17	5419	7-Dec-21	0:38	1.129319	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	300.3 (High Cautionary Limit Exceeded)	Active	
19	18	5419	7-Dec-21	0:38	10.69276	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	299.5 (High Cautionary Limit Exceeded)	Cleared	
20	19	5421	7-Dec-21	0:38	13.82554	/INCOM/Network/A92/mACTransVCN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vcn	300.1 (High Cautionary Limit Exceeded)	Active	
21	20	5419	7-Dec-21	0:38	16.97913	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	300.7 (High Cautionary Limit Exceeded)	Active	
22	21	5421	7-Dec-21	0:38	16.97913	/INCOM/Network/A92/mACTransVCN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vcn	299.2 (High Cautionary Limit Exceeded)	Cleared	
23	22	5420	7-Dec-21	0:38	18.12062	/INCOM/Network/A97/mACTransVBN/Value	*440 14Th St - DTER 1306(TEMP 2761) - 1097P	Transformer Vbn	300.8 (High Cautionary Limit Exceeded)	Active	
24	23	5420	7-Dec-21	0:38	21.27814	/INCOM/Network/A97/mACTransVBN/Value	*440 14Th St - DTER 1306(TEMP 2761) - 1097P	Transformer Vbn	299 (High Cautionary Limit Exceeded)	Cleared	
25	24	5419	7-Dec-21	0:38	29.46697	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	299.8 (High Cautionary Limit Exceeded)	Cleared	
26	25	5419	7-Dec-21	0:38	32.64593	/INCOM/Network/A92/mACTransVBN/Value	*440 14Th St - DTER 1304(TEMP 2759) - 1092P	Transformer Vbn	300.3 (High Cautionary Limit Exceeded)	Active	

vg-eventlog-2023-03-17

Ready

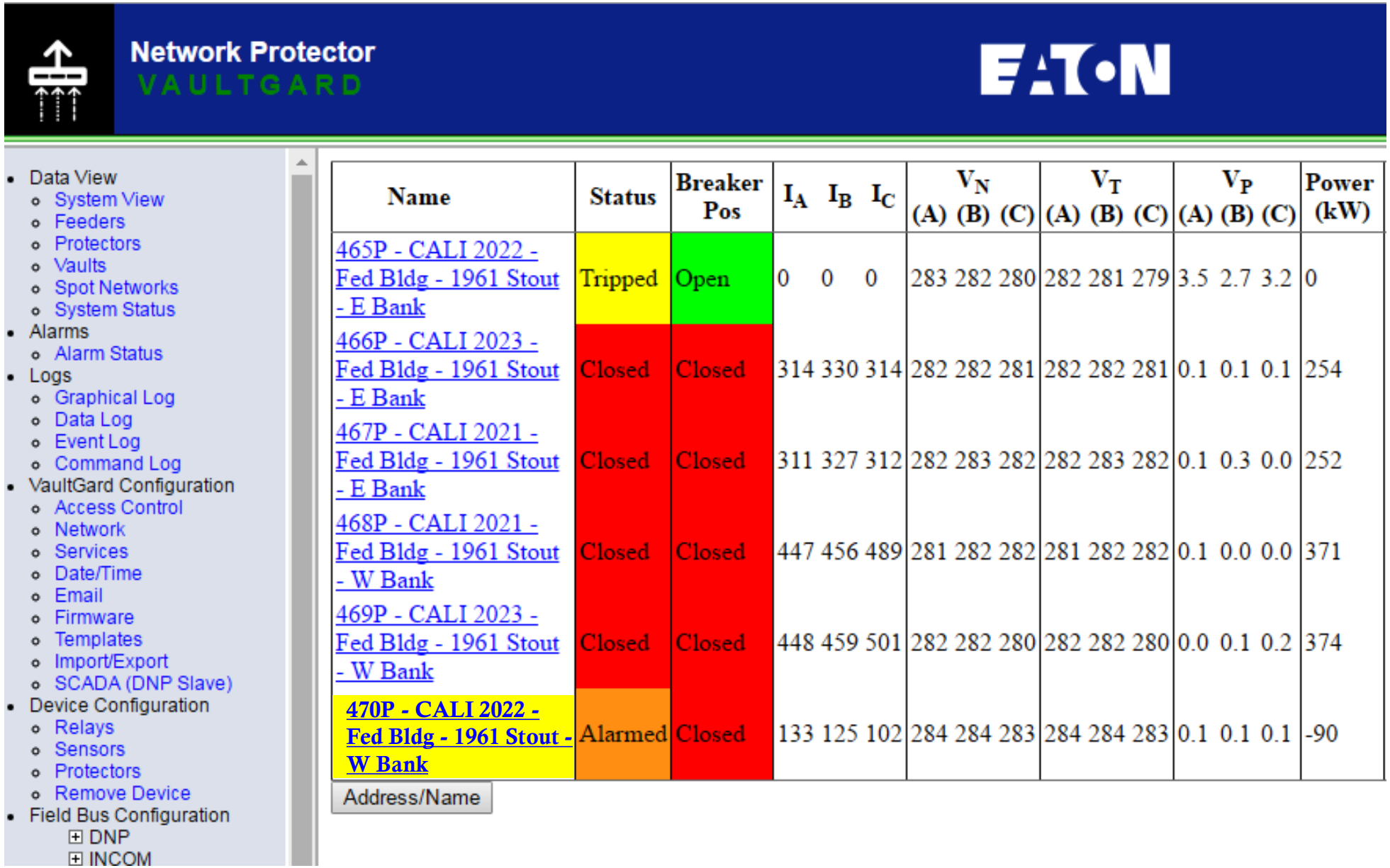
Secondary Accident - Recorded

Time	Time(seconds)	Device Display Name	Name	Value	Condition
22:51	43.144405	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ia	8714 (Caution - High Current Phase A)	Active
22:51	43.144405	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ib	8980 (Caution - High Current Phase B)	Active
22:51	43.144405	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ic	8948 (Caution - High Current Phase C)	Active
22:51	46.256009	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ia	154.49 (Caution - High Current Phase A)	Cleared
22:51	46.256009	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ib	138.49 (Caution - High Current Phase B)	Cleared
22:51	46.256009	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ic	158.99 (Caution - High Current Phase C)	Cleared
22:54	1.043625	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ia	8686 (Caution - High Current Phase A)	Active
22:54	1.043625	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ic	8766 (Caution - High Current Phase C)	Active
22:54	4.168012	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ia	145.49 (Caution - High Current Phase A)	Cleared
22:54	4.168012	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ic	159.49 (Caution - High Current Phase C)	Cleared
22:54	35.505058	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ia	4772 (Caution - High Current Phase A)	Active
22:54	38.628072	ABC Hotel - Bsmnt - DENV 1711 - 853P	Ia	165 (Caution - High Current Phase A)	Cleared

Faulted Transformer

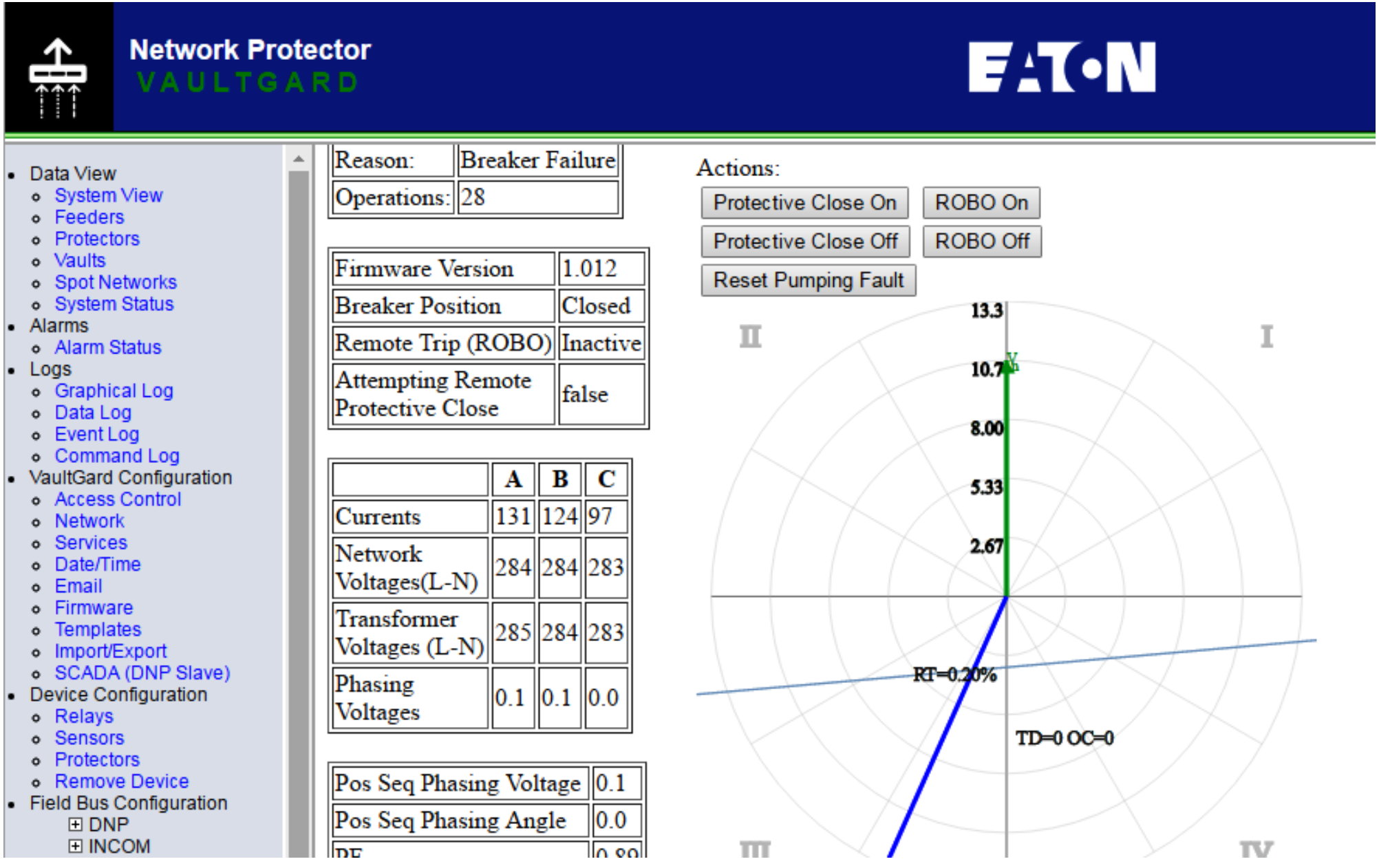
	A	B	C	D	E
1	Date	Time	Time(seconds)	Device Display Name	Parameter Display Name
2					
3	5/9/2017	6:39	41.942918	497P - ELAT 1096 - MH 14-03-06	Trip Event
4	5/9/2017	6:39	42.136948	100P - ELAT1096 - Brown Palace Hotel - 321 17th Sidewalk	Trip Event
5	5/9/2017	6:39	42.392415	819P - ELAT1096 - Republic Plaza -1620 Tremont 56th Fl 16th St	Trip Event
6	5/9/2017	6:39	42.447324	740P - ELAT1096 - Republic Plaza Basement - 16th St Side	Trip Event
7	5/9/2017	6:39	43.564038	105P - ELAT1098 - Mile High Center - 1700 Broadway - 120 V Side	Trip Event
8	5/9/2017	6:39	43.787273	819P - ELAT1096 - Republic Plaza -1620 Tremont 56th Fl 16th St	Over Current
9	5/9/2017	6:39	44.74413	740P - ELAT1096 - Republic Plaza Basement - 16th St Side	Over Current
10	5/9/2017	6:39	44.833326	381P - ELAT1096 - McDonalds - 200 16th Sidewalk	Trip Event
11	5/9/2017	6:39	46.323821	928P - ELAT1096-Adams Mark Hotel - South Bank	Trip Event
12	5/9/2017	6:39	46.562002	083P - ELAT1096 - MH 16-3-10	Trip Event
13	5/9/2017	6:39	46.658068	816P - ELAT1096 - Republic Plaza -1620 Tremont 56th Fl 17th St	Over Current
14	5/9/2017	6:39	49.549107	103P - ELAT1096 - Mile High Center - 1700 Broadway - 120 V Side	Trip Event
15	5/9/2017	6:39	50.174022	103P - ELAT1096 - Mile High Center - 1700 Broadway - 120 V Side	Over Current
16	5/9/2017	6:39	53.260537	816P - ELAT1096 - Republic Plaza -1620 Tremont 56th Fl 17th St	Over Current
17	5/9/2017	6:39	53.5617	103P - ELAT1096 - Mile High Center - 1700 Broadway - 120 V Side	Over Current

Potential Return - Protector

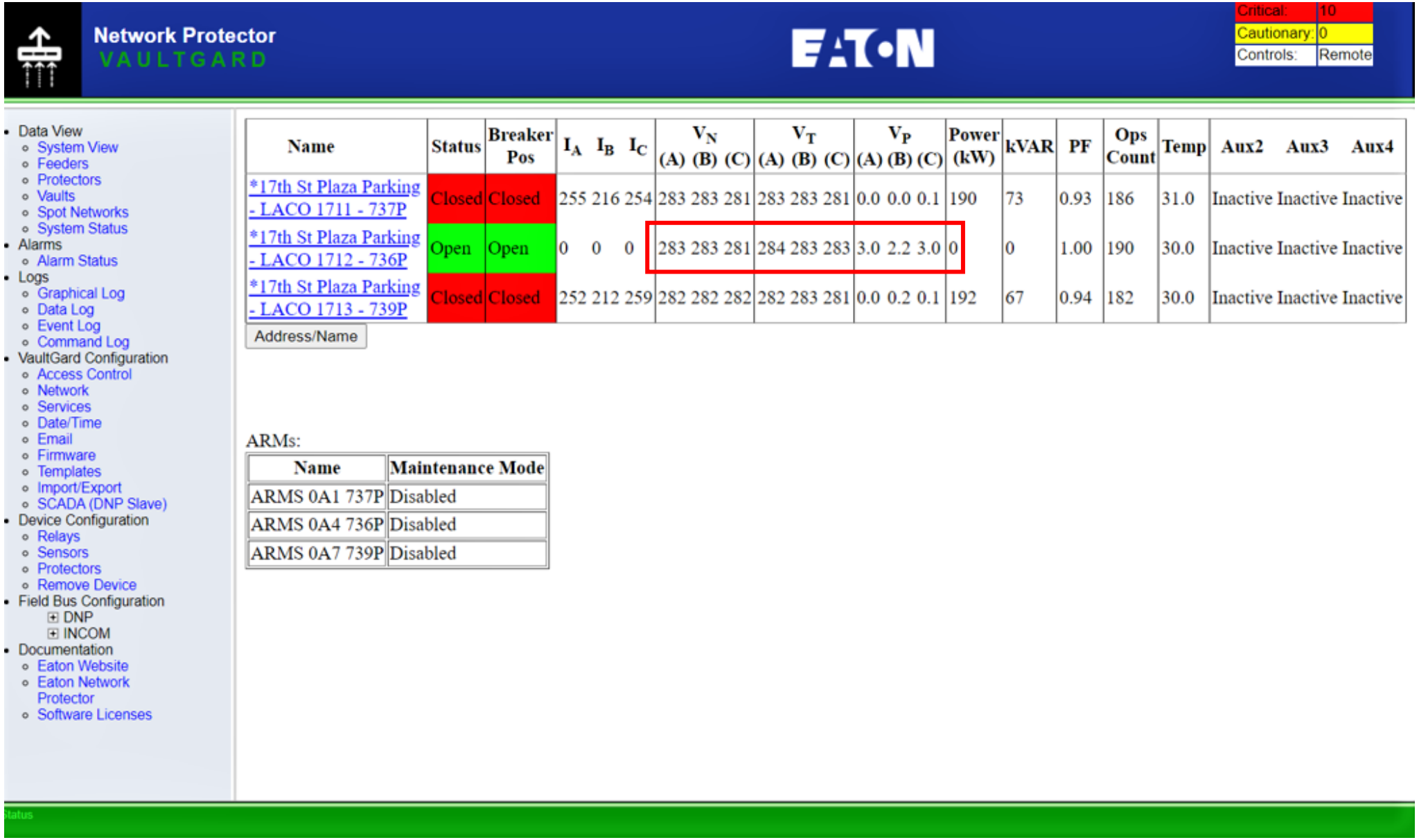


Name	Status	Breaker Pos	I_A	I_B	I_C	V_N (A)	V_N (B)	V_N (C)	V_T (A)	V_T (B)	V_T (C)	V_P (A)	V_P (B)	V_P (C)	Power (kW)
465P - CALI 2022 - Fed Bldg - 1961 Stout - E Bank	Tripped	Open	0	0	0	283	282	280	282	281	279	3.5	2.7	3.2	0
466P - CALI 2023 - Fed Bldg - 1961 Stout - E Bank	Closed	Closed	314	330	314	282	282	281	282	282	281	0.1	0.1	0.1	254
467P - CALI 2021 - Fed Bldg - 1961 Stout - E Bank	Closed	Closed	311	327	312	282	283	282	282	283	282	0.1	0.3	0.0	252
468P - CALI 2021 - Fed Bldg - 1961 Stout - W Bank	Closed	Closed	447	456	489	281	282	282	281	282	282	0.1	0.0	0.0	371
469P - CALI 2023 - Fed Bldg - 1961 Stout - W Bank	Closed	Closed	448	459	501	282	282	280	282	282	280	0.0	0.1	0.2	374
470P - CALI 2022 - Fed Bldg - 1961 Stout - W Bank	Alarmed	Closed	133	125	102	284	284	283	284	284	283	0.1	0.1	0.1	-90

Potential Return - Protector



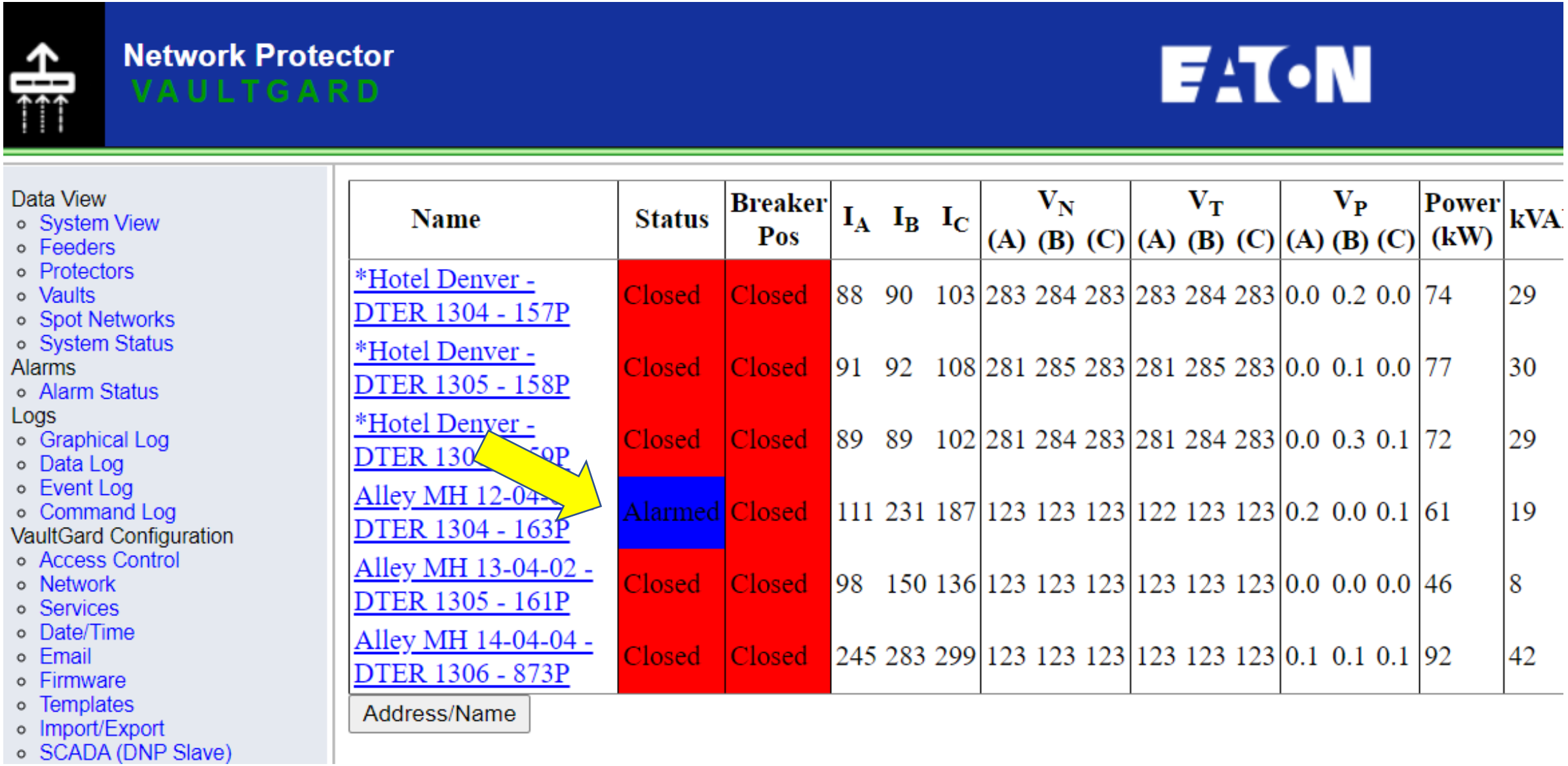
Phasing Cables



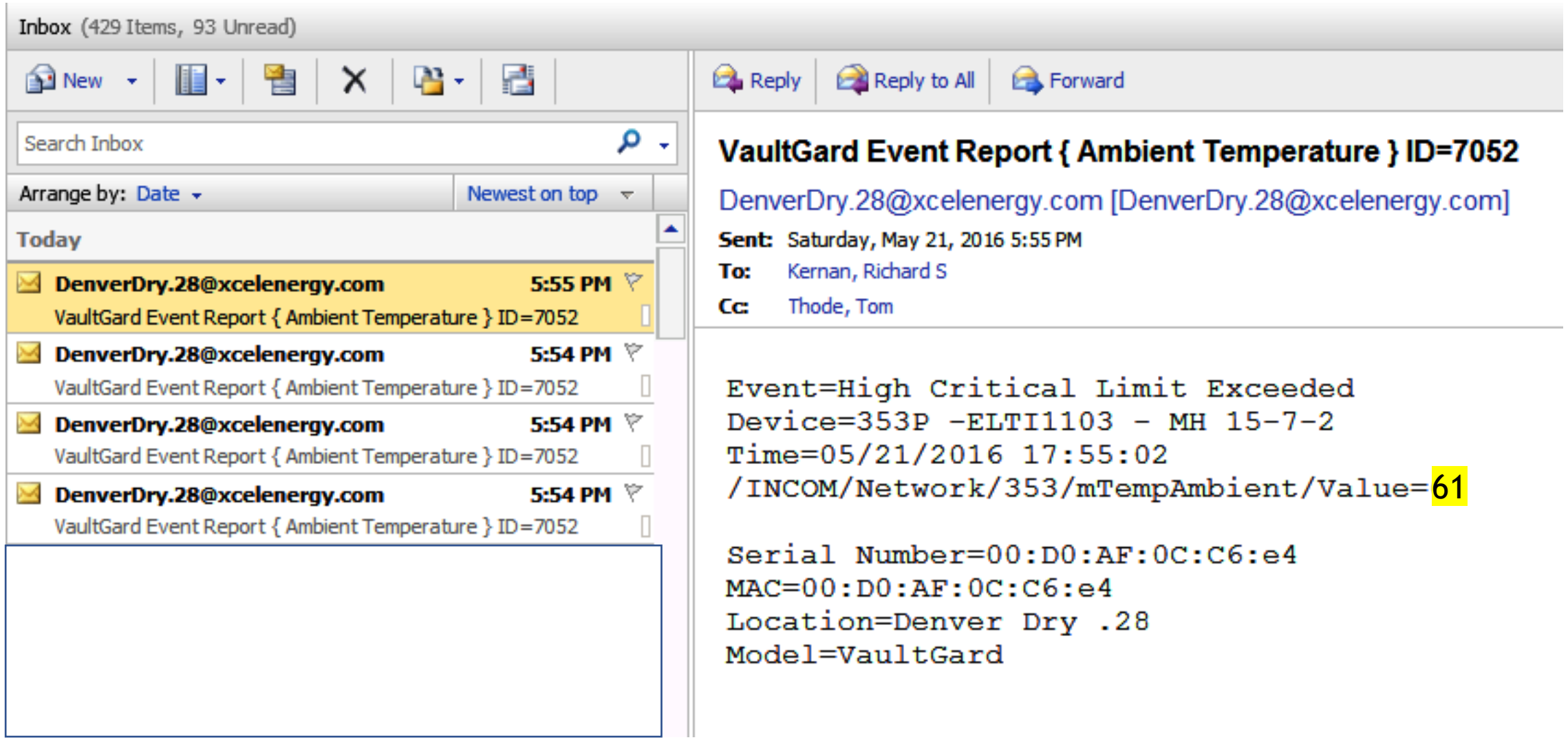
Name	Status	Breaker Pos	I_A	I_B	I_C	V_N (A)	V_N (B)	V_N (C)	V_T (A)	V_T (B)	V_T (C)	V_P (A)	V_P (B)	V_P (C)	Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
*17th St Plaza Parking - LACO 1711 - 737P	Closed	Closed	255	216	254	283	283	281	283	283	281	0.0	0.0	0.1	190	73	0.93	186	31.0	Inactive	Inactive	Inactive
*17th St Plaza Parking - LACO 1712 - 736P	Open	Open	0	0	0	283	283	281	284	283	283	3.0	2.2	3.0	0	0	1.00	190	30.0	Inactive	Inactive	Inactive
*17th St Plaza Parking - LACO 1713 - 739P	Closed	Closed	252	212	259	282	282	282	282	283	281	0.0	0.2	0.1	192	67	0.94	182	30.0	Inactive	Inactive	Inactive

Name	Maintenance Mode
ARMS 0A1 737P	Disabled
ARMS 0A4 736P	Disabled
ARMS 0A7 739P	Disabled

High Water Alarm



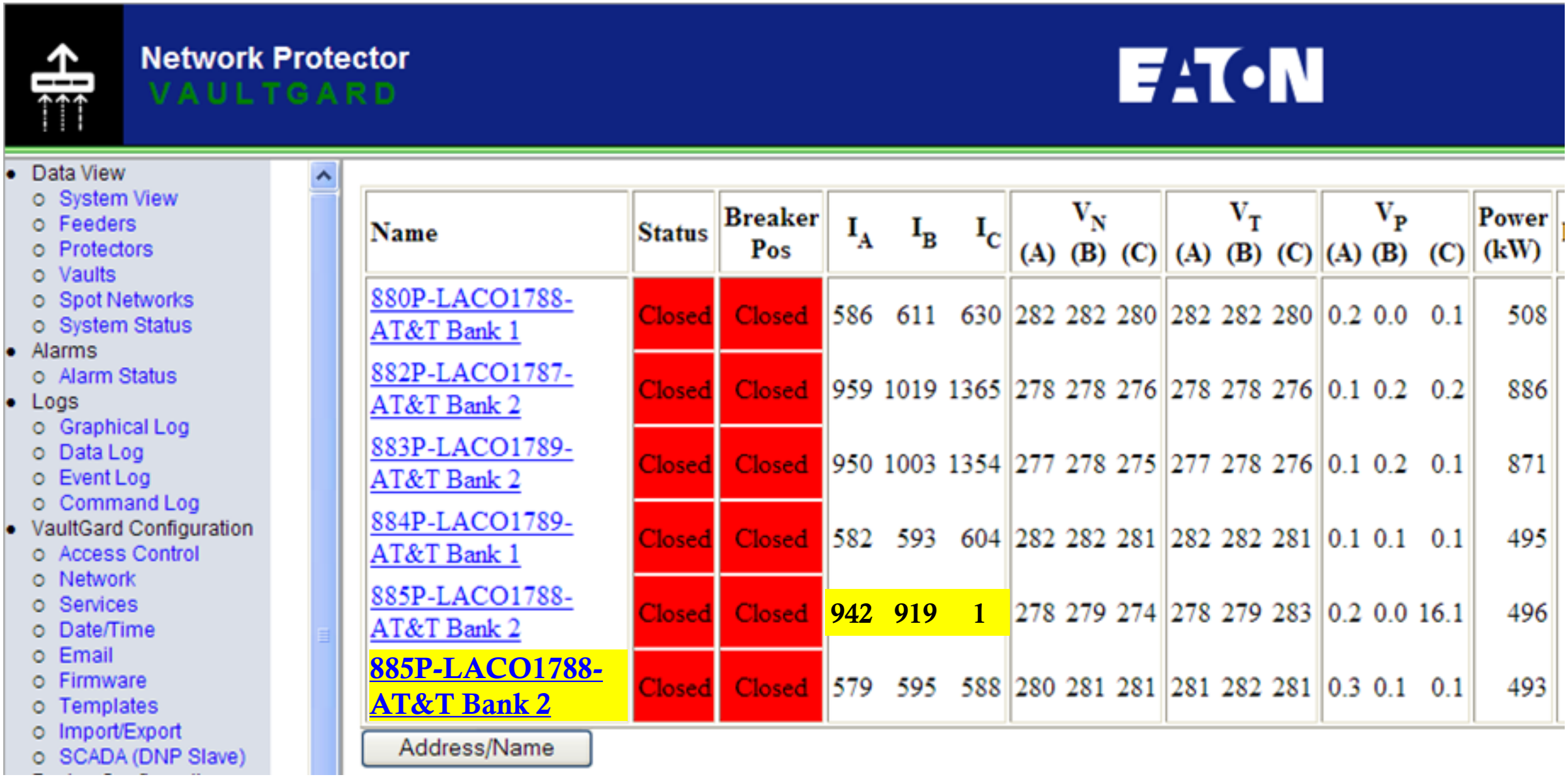
High Temperature Warning



High Temperature Warning

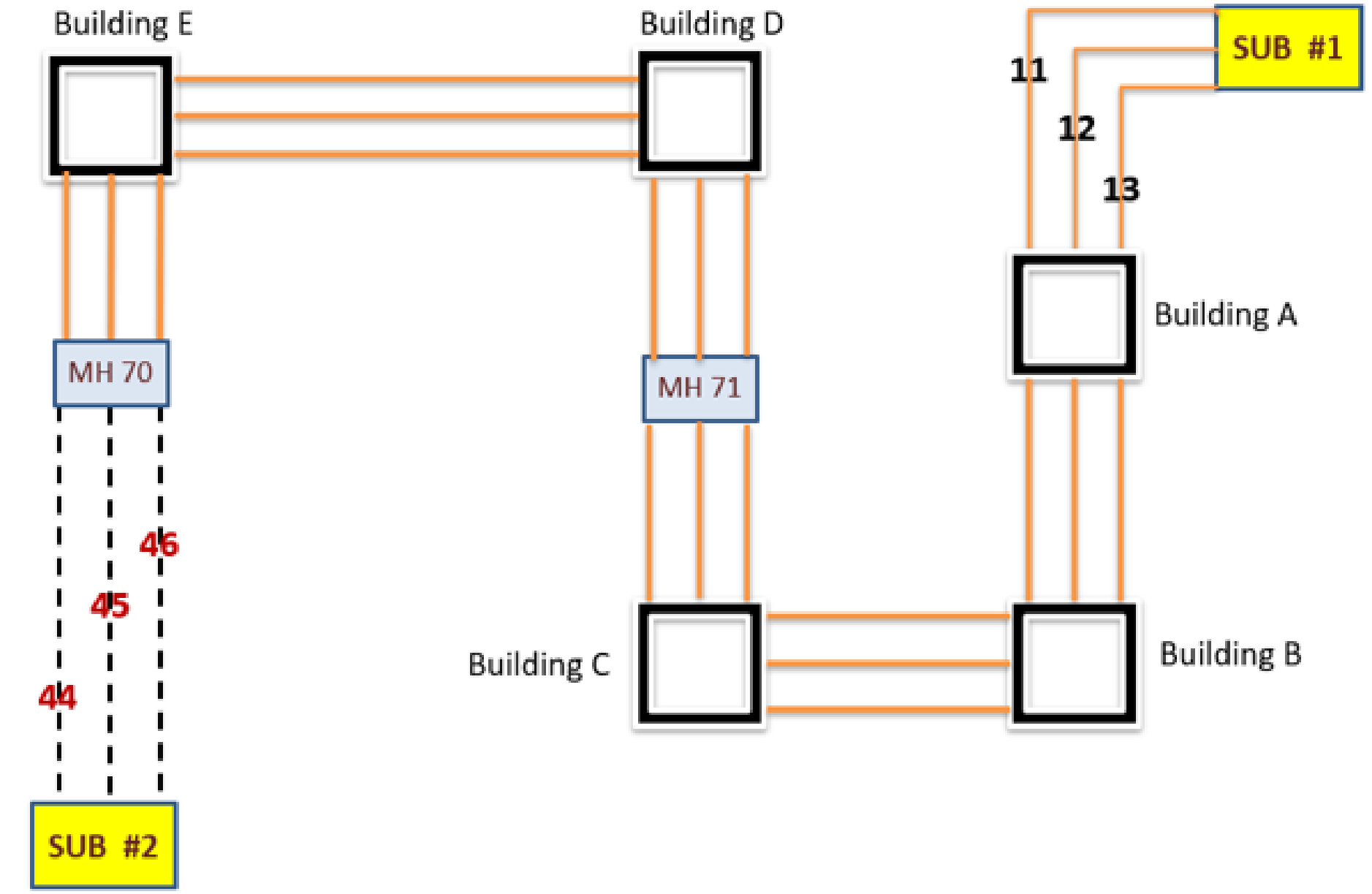
Name	Status	Breaker Pos	I_A	I_B	I_C	V_N (A)	V_N (B)	V_N (C)	V_T (A)	V_T (B)	V_T (C)	V_P (A)	V_P (B)	V_P (C)	Power (kW)	kVAR	PF	Ops Count	Temp
178P-ELAT1103-Denver Dry Building	Closed	Closed	115	119	124	124	124	124	124	124	124	0.0	0.0	0.0	40	19	0.91	44	40.0
244P-ELAT1104-Neusteters	Closed	Closed	230	227	263	119	125	119	119	125	119	0.0	0.0	0.0	78	41	0.89	29	44.0
353P -ELTI1103 – MH 15-7-2	Closed	Closed	128	129	134	124	124	124	124	124	124	0.1	0.0	0.0	44	20	0.90	51	61.0

Catastrophic Breaker Failure



Name	Status	Breaker Pos	I_A	I_B	I_C	V_N (A)	V_N (B)	V_N (C)	V_T (A)	V_T (B)	V_T (C)	V_P (A)	V_P (B)	V_P (C)	Power (kW)
880P-LACO1788-AT&T Bank 1	Closed	Closed	586	611	630	282	282	280	282	282	280	0.2	0.0	0.1	508
882P-LACO1787-AT&T Bank 2	Closed	Closed	959	1019	1365	278	278	276	278	278	276	0.1	0.2	0.2	886
883P-LACO1789-AT&T Bank 2	Closed	Closed	950	1003	1354	277	278	275	277	278	276	0.1	0.2	0.1	871
884P-LACO1789-AT&T Bank 1	Closed	Closed	582	593	604	282	282	281	282	282	281	0.1	0.1	0.1	495
885P-LACO1788-AT&T Bank 2	Closed	Closed	942	919	1	278	279	274	278	279	283	0.2	0.0	16.1	496
885P-LACO1788-AT&T Bank 2	Closed	Closed	579	595	588	280	281	281	281	282	281	0.3	0.1	0.1	493

Network Re-route

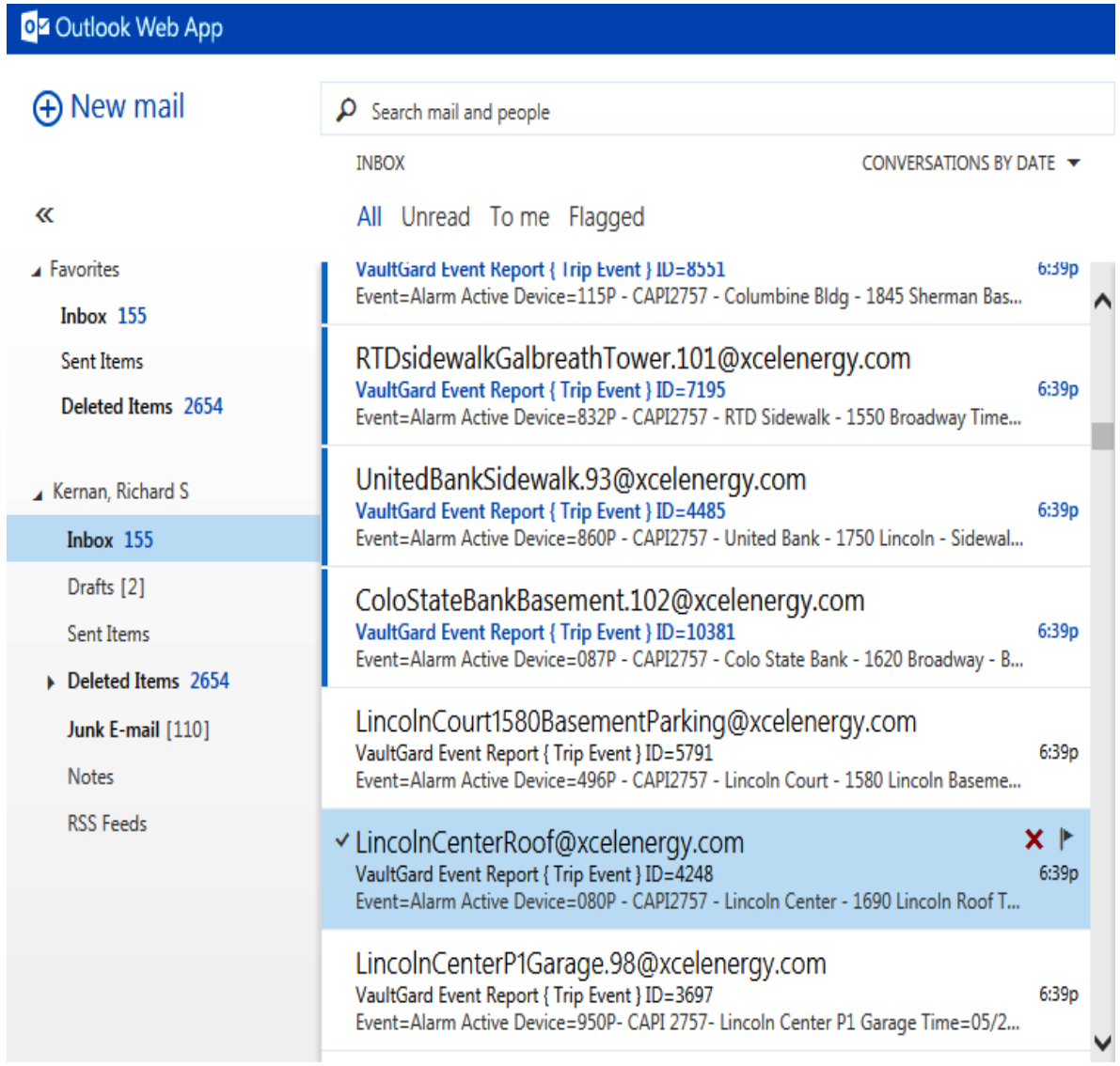


Fault Locating Using Vaultgard

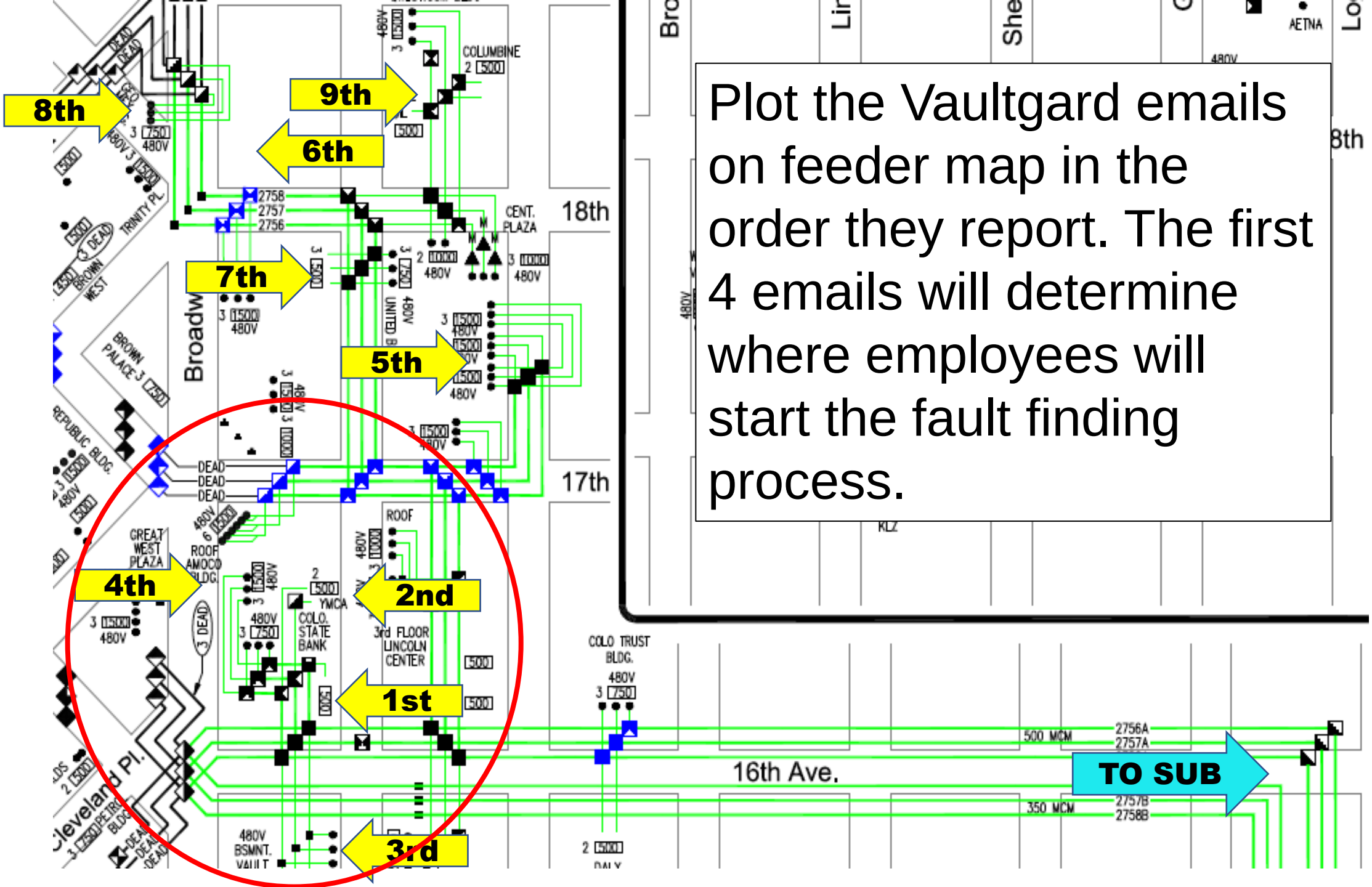
The crews at Xcel Energy has developed a procedure to use Vaultgard when a circuit lockout occurs.

- Step #1 – Check Vaultgard emails.
- Step #2 – Plot the emails on the feeder map in the order they came in.
- Step #3 – Download Event Logs from all Vaultgards associated with the locked out circuit.
- Step #4 – Evaluate all event logs. Separate all events into categories.
- Step #5 – Dispatch crew to projected area & start fault finding.

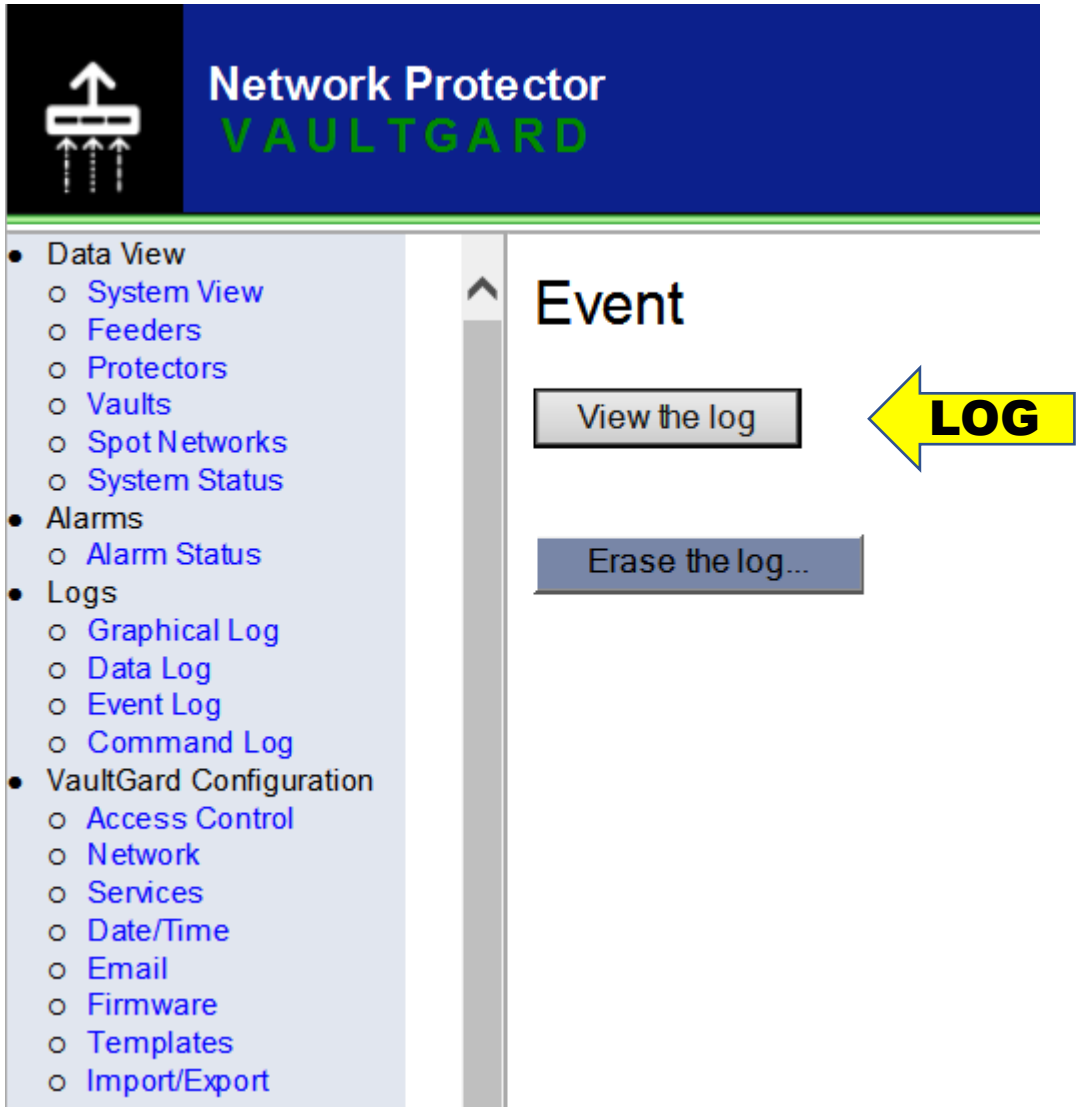
Step #1 – Check Emails



These are emails from a circuit lockout #1. The order they come in is the key to finding the area where the fault is located.


8th
9th
6th
7th
5th
4th
2nd
1st
3rd
Plot the Vaultgard emails on feeder map in the order they report. The first 4 emails will determine where employees will start the fault finding process.
TO SUB
16th Ave.
17th
18th
Broadway
Cleveland Pl.
TRINITY PL
BROWN WEST
BROWN PALACE
REPUBLIC BLDG.
GREAT WEST PLAZA
ROOF AMOCO BLDG.
COLO. STATE BANK
YMCA
3rd FLOOR LINCOLN CENTER
COLO TRUST BLDG.
CENT. PLAZA
UNITED B
COLUMBINE
AETNA
KLZ
480V BSMNT. VAULT
500 MCM
350 MCM
2756A
2757A
2757B
2758B
2758
2757
2756
DEAD

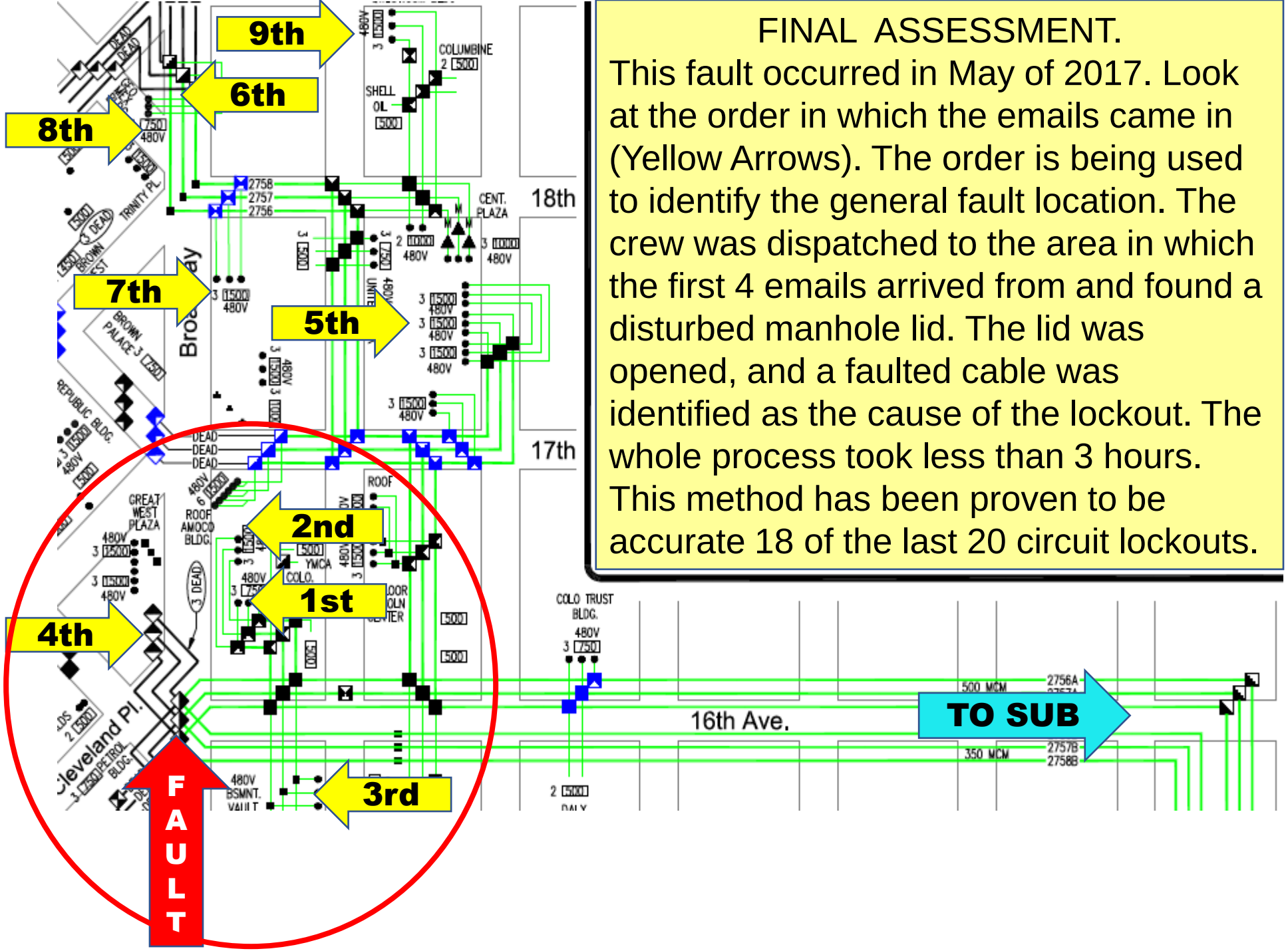
Step #3 – Download Event Log



Click on the Vaultgard "View the log" button. Download the event log of every Vaultgard associated with the locked-out circuit into an excel spread sheet.

Step #4 – Evaluate Event Log

	A	B	C	D	E
1	Date	Time	Time(seconds)	Device Display Name	Parameter Display Name
2					
3	5/25/2017	18:39	23.894298	496P - CAPI2757 - Lincoln Court - 1580 Lincoln Basement Parking	Trip Event
4	5/25/2017	18:39	23.927144	080P - CAPI2757 - Lincoln Center - 1690 Lincoln Roof	Trip Event
5	5/25/2017	18:39	24.114642	227P - CAPI2757 - Soho Bldg - 1800 Glenarm - Sidewalk	Trip Event
6	5/25/2017	18:39	24.36413	950P- CAPI 2757- Lincoln Center P1 Garage	Trip Event
7	5/25/2017	18:39	24.413596	832P - CAPI2757 - RTD Sidewalk - 1550 Broadway	Trip Event
8	5/25/2017	18:39	24.491027	860P - CAPI2757 - United Bank - 1750 Lincoln - Sidewalk E Side	Trip Event
9	5/25/2017	18:39	24.82233	087P - CAPI2757 - Colo State Bank - 1620 Broadway - Basement	Trip Event
10	5/25/2017	18:39	25.212713	081P - CAPI2758 - Lincoln Center - 1690 Lincoln Roof	Trip Event
11	5/25/2017	18:39	25.255871	503P - CAPI2757 - United Bank - 1700 Lincoln - Bsmnt - 1st Bank	Trip Event
12	5/25/2017	18:39	25.287772	115P - CAPI2757 - Columbine Bldg - 1845 Sherman Basement	Trip Event
13	5/25/2017	18:39	25.347354	481P - ELAT2757 - Amoco Bldg - 1690 Broadway - 36th Fl E Bank	Trip Event
14	5/25/2017	18:39	25.919534	071P - CAPI2757 - Daly Bldg - 1576 Sherman Alley	Trip Event
15	5/25/2017	18:39	26.49674	124P - CAPI2757 - United Bank - 1751 Lincoln - 120 V - W Side	Trip Event
16	5/25/2017	18:39	26.835828	811P - CAPI2757 - Mellon Financial - 18th & Sherman - 8th Fl	Trip Event
17	5/25/2017	18:39	26.882441	085P - CAPI2757 - YMCA - 1625 Lincoln MH E 16-0-4	Trip Event
18	5/25/2017	18:39	27.180366	825P - CAPI2757 - Galbreath Tower - 1560 Broadway	Trip Event



FINAL ASSESSMENT.

This fault occurred in May of 2017. Look at the order in which the emails came in (Yellow Arrows). The order is being used to identify the general fault location. The crew was dispatched to the area in which the first 4 emails arrived from and found a disturbed manhole lid. The lid was opened, and a faulted cable was identified as the cause of the lockout. The whole process took less than 3 hours. This method has been proven to be accurate 18 of the last 20 circuit lockouts.

Faulted cable


10°
25°
0°
35°
MIN
MAX

Vaultgard Benefits & Cost Savings

Daily System Monitoring
Customized Breaker Parameters
Real Time System Recording
Documentation of System Performance
Identification of System Deficiencies
Distressed Equipment Identification
Real Time Instantaneous Email Notifications
Potential Return Identifier
Real Time Secondary Phasing
Fault Locating Abilities