

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 VaultGuard 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 VaultGuard can be trended and analyzed different ways to determine predictive maintenance schedules.

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

Status:	Open
Reason:	Remote Open Block Open
Operations:	172

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

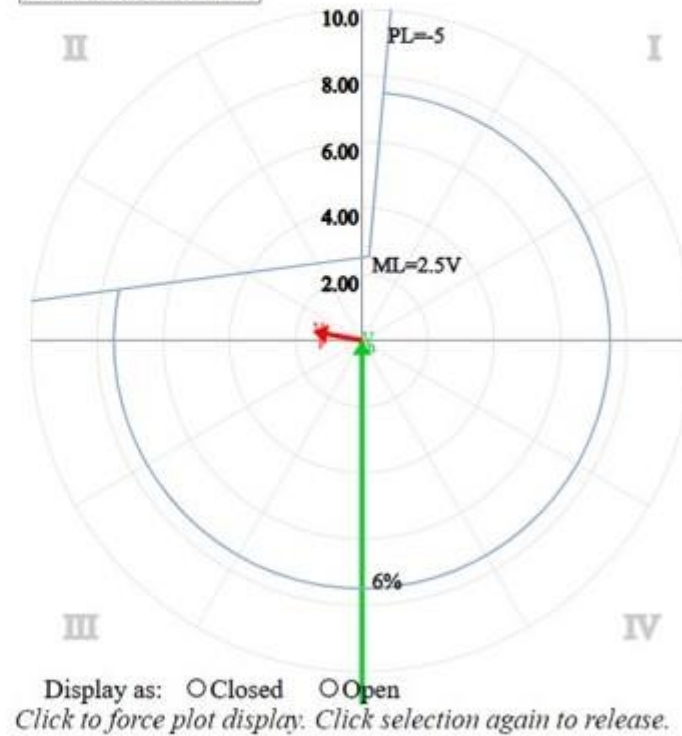
	A	B	C
Currents	0	0	0
Network Voltages(L-N)	283	283	282
Transformer Voltages (L-N)	284	284	283
Phasing Voltages	3.2	3.3	3.7

Pos Seq Phasing Voltage	3.4
Pos Seq Phasing Angle	79.7
PF	1.00
Power (kW)	0
Reactive Power (kVARs)	0
Temperature (C)	18.0

• [View Trip Log](#)

Actions:

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





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



Critical	3
Cautionary	0
Controls:	Remote

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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
Denver Hotel – Bsmnt – SUCO A10 – 853P	Closed	Closed	223	204	207	280 281 278	280 281 278	0.1 0.1 0.1	170	46	0.96	126	41.0	Inactive	Inactive	Inactive
Denver Hotel – Bsmnt – SUCO A11 – 851P	Closed	Closed	225	206	209	278 281 279	278 280 279	0.0 0.2 0.2	172	46	0.96	126	41.0	Inactive	Inactive	Inactive
Denver Hotel – Bsmnt – SUCO A13 – 852P	Closed	Closed	217	199	198	280 280 279	280 280 279	0.1 0.1 0.1	164	47	0.96	127	41.0	Inactive	Inactive	Inactive

Address/Name

ARMs:

Name	Maintenance Mode
ARMS 0A1 853P	Disabled
ARMS 0A4 851P	Disabled
ARMS 0A7 852P	Disabled

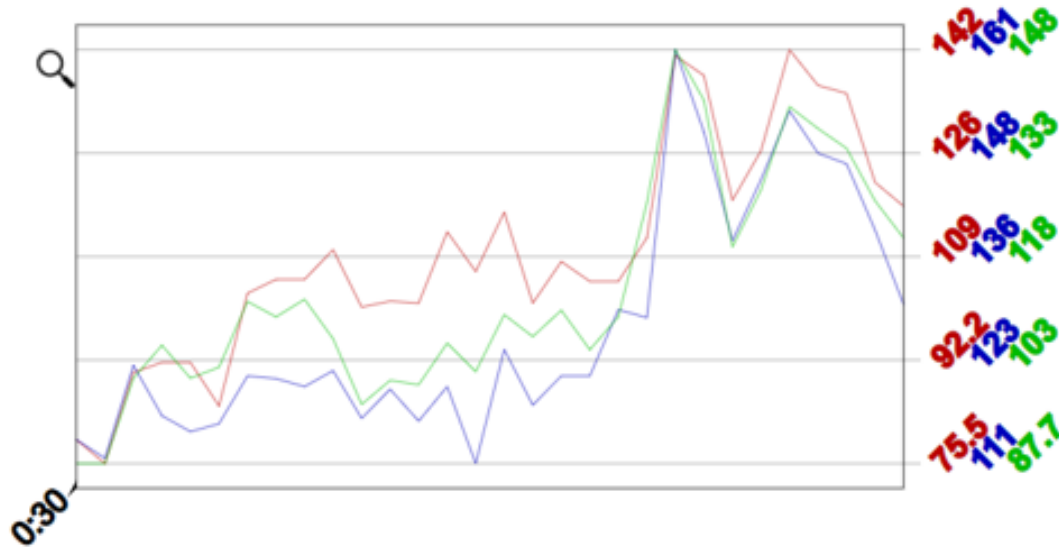


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Interval Graphs

Vaultgard Graphical View

Success.



From Date: To Date: Log Extent:

Plot Selection:

Add

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



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[View Log Data](#) [Download to CSV](#)

Show 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](#)

	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													

Vaultgard Event Logs

The screenshot displays the Eaton Vaultgard Network Protector web interface. The top navigation bar is blue and contains the Eaton logo, the product name 'Network Protector VAULTGARD', and status information including 'Critical: 31', 'Cautionary: 6', 'Controls: Remote', and 'VaultGard Time: 03/16/2023 07:48:16 MDT'. A sidebar on the left lists various system components and configuration options. The main content area is titled 'Event' and contains two buttons: 'View the log' and 'Erase the log...'. The bottom of the page features a green status bar with the text 'Status' on the left and 'Copyright 2011 Eaton Corporation. All Rights Reserved' on the right.

Network Protector VAULTGARD

EATON

Critical: 31
Cautionary: 6
Controls: Remote

VaultGard Time:
03/16/2023 07:48:16 MDT
440 14Th St .33
 Enable 30 second auto-refresh

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Event

View the log

Erase the log...

Status

Copyright 2011 Eaton Corporation. All Rights Reserved

Events Log

Index	Event ID	Date	Time	Time(sec)	Path	Device Display Name	Parameter Display Name	Value	Condition	Active
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	


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 Broadwav - 120 V Side	Over Current

Potential Return - Protector




Network Protector
VAULTGARD



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Name	Status	Breaker Pos	I _A I _B I _C			V _N			V _T			V _P			Power (kW)
			(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)				
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



Network Protector

VAULTGARD



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Reason:	Breaker Failure
Operations:	28

Firmware Version	1.012
Breaker Position	Closed
Remote Trip (ROBO)	Inactive
Attempting Remote Protective Close	false

	A	B	C
Currents	131	124	97
Network Voltages(L-N)	284	284	283
Transformer Voltages (L-N)	285	284	283
Phasing Voltages	0.1	0.1	0.0

Pos Seq Phasing Voltage	0.1
Pos Seq Phasing Angle	0.0

Actions:

Protective Close On

ROBO On

Protective Close Off

ROBO Off

Reset Pumping Fault



Phasing Cables




Critical:	10
Cautionary:	0
Controls:	Remote

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 - SCADA (DNP Slave)
- Device Configuration
 - Relays
 - Sensors
 - Protectors
 - Remove Device
- Field Bus Configuration
 - ⊕ DNP
 - ⊕ INCOM
- Documentation
 - Eaton Website
 - Eaton Network Protector
 - Software Licenses

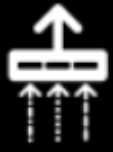
Name	Status	Breaker Pos	I _A I _B I _C			V _N			V _T			V _P			Power (kW)	kVAR	PF	Ops Count	Temp	Aux2	Aux3	Aux4
			(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)											
*17th St Plaza Parking - LACO 1711 - 737P	Closed	Closed	255	216	254	283	283	281	283	283	281	0.0	0.0	0.1	190	73	0.93	186	31.0	Inactive	Inactive	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

Address/Name

ARMS:

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

High Water Alarm



Network Protector
VAULTGARD



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Name	Status	Breaker Pos	I _A I _B I _C			V _N			V _T			V _P			Power (kW)	kVA
			(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)					
*Hotel Denver - DTER 1304 - 157P	Closed	Closed	88	90	103	283	284	283	283	284	283	0.0	0.2	0.0	74	29
*Hotel Denver - DTER 1305 - 158P	Closed	Closed	91	92	108	281	285	283	281	285	283	0.0	0.1	0.0	77	30
*Hotel Denver - DTER 1306 - 159P	Closed	Closed	89	89	102	281	284	283	281	284	283	0.0	0.3	0.1	72	29
Alley MH 12-04-01 - DTER 1304 - 163P	Alarmed	Closed	111	231	187	123	123	123	122	123	123	0.2	0.0	0.1	61	19
Alley MH 13-04-02 - DTER 1305 - 161P	Closed	Closed	98	150	136	123	123	123	123	123	123	0.0	0.0	0.0	46	8
Alley MH 14-04-04 - DTER 1306 - 873P	Closed	Closed	245	283	299	123	123	123	123	123	123	0.1	0.1	0.1	92	42

Address/Name

High Temperature Warning

Inbox (429 Items, 93 Unread)

New | | X | | |

Search Inbox

Arrange by: Date | Newest on top

Today

- DenverDry.28@xcelenergy.com 5:55 PM
VaultGard Event Report { Ambient Temperature } ID=7052
- DenverDry.28@xcelenergy.com 5:54 PM
VaultGard Event Report { Ambient Temperature } ID=7052
- DenverDry.28@xcelenergy.com 5:54 PM
VaultGard Event Report { Ambient Temperature } ID=7052
- DenverDry.28@xcelenergy.com 5:54 PM
VaultGard Event Report { Ambient Temperature } ID=7052

Reply | Reply to All | Forward

VaultGard Event Report { Ambient Temperature } ID=7052
DenverDry.28@xcelenergy.com [DenverDry.28@xcelenergy.com]
Sent: Saturday, May 21, 2016 5:55 PM
To: Kernan, Richard S
Cc: Thode, Tom

Event=High Critical Limit Exceeded
Device=353P -ELTI1103 - MH 15-7-2
Time=05/21/2016 17:55:02
/INCOM/Network/353/mTempAmbient/Value=61

Serial Number=00:D0:AF:0C:C6:e4
MAC=00:D0:AF:0C:C6:e4
Location=Denver Dry .28
Model=VaultGard

High Temperature Warning

tor
D


Critical:	15
Cautionary:	5
Controls:	Remote

Name	Status	Breaker Pos	I _A	I _B	I _C	V _N			V _T			V _P			Power (kW)	kVAR	PF	Ops Count	Temp
						(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)					
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



Network Protector
VAULTGARD

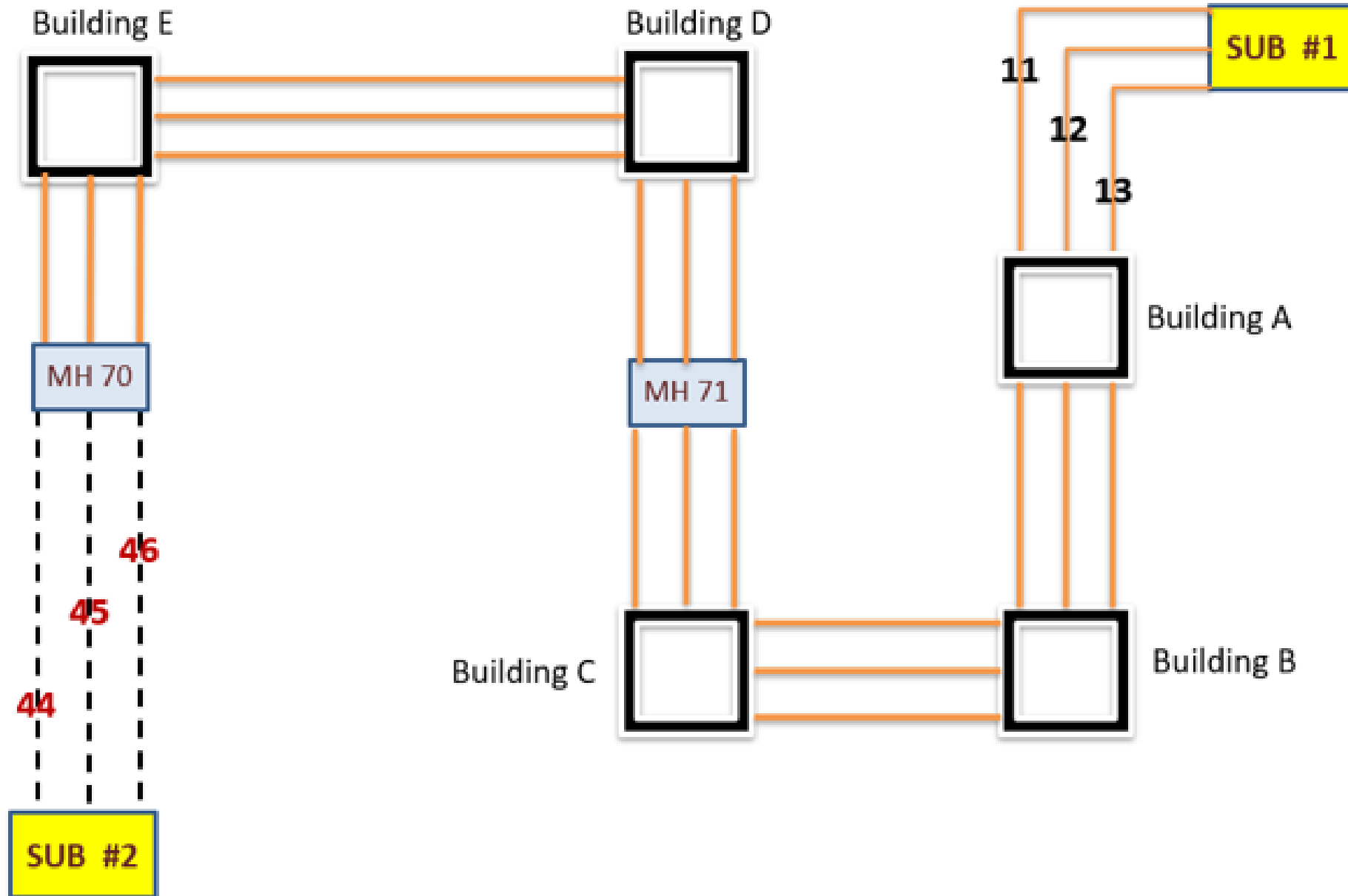
EATON

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Name	Status	Breaker Pos	I _A	I _B	I _C	V _N			V _T			V _P			Power (kW)
						(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)	
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

Address/Name

Network Re-route



Fault Locating Using Vaultgard

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

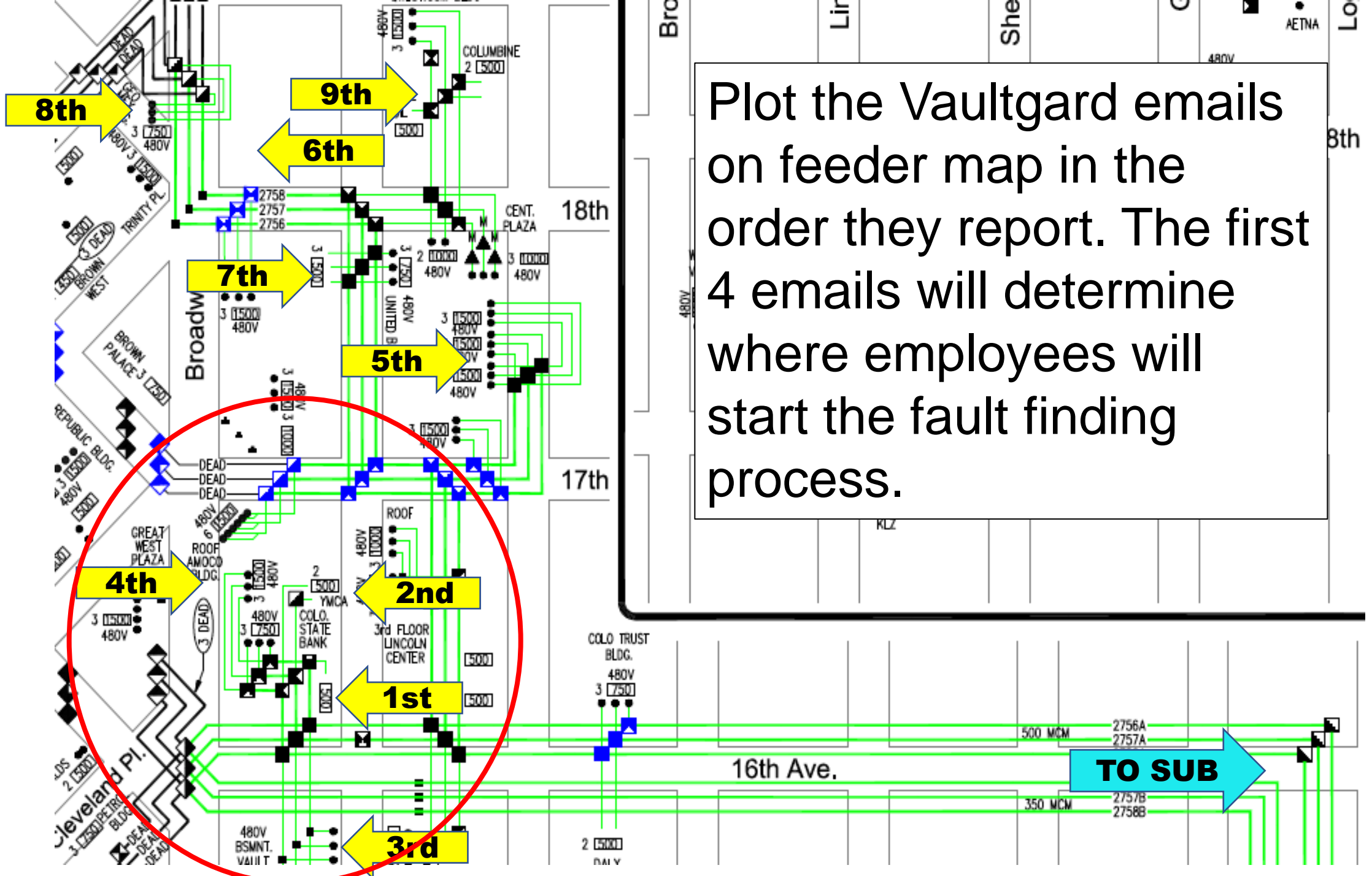
- Step #1 – Check Vaultgard emails.
- Step #2 – Plot the emails on the feeder map in the order they came in.
- Step #3 – Download Event Logs from all Vaultgards associated with the locked out circuit.
- Step #4 – Evaluate all event logs. Separate all events into categories.
- Step #5 – Dispatch crew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

Step #1 – Check Emails

The screenshot shows the Outlook Web App interface. The left sidebar contains navigation options: 'New mail', 'Favorites' (Inbox 155, Sent Items, Deleted Items 2654), and 'Kernan, Richard S' (Inbox 155, Drafts [2], Sent Items, Deleted Items 2654, Junk E-mail [110], Notes, RSS Feeds). The main area displays an inbox with a search bar and filters for 'All', 'Unread', 'To me', and 'Flagged'. The inbox is sorted by date. The following table summarizes the visible email entries:

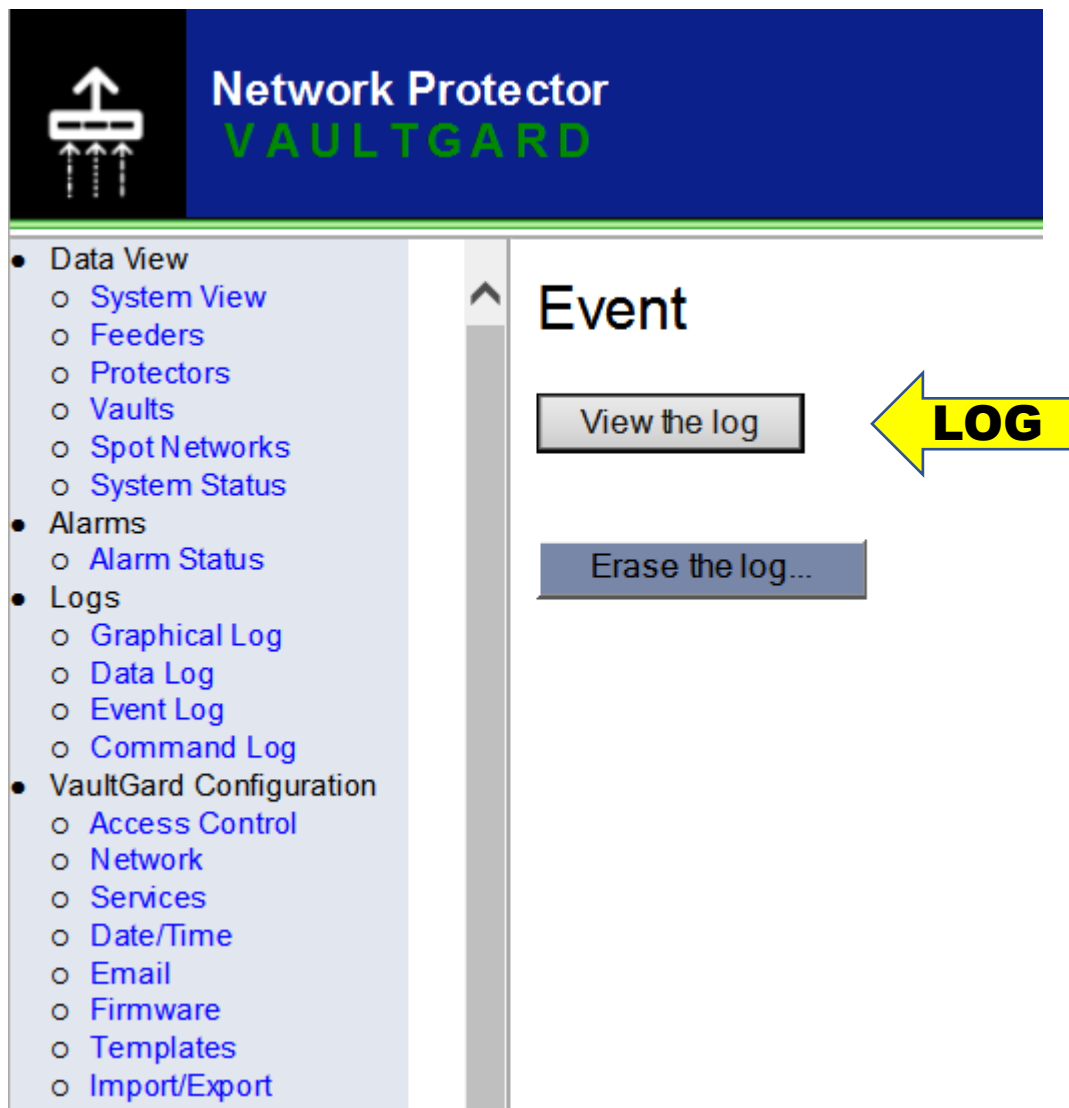
Sender	Subject	Time
VaultGard Event Report { Trip Event } ID=8551	Event=Alarm Active Device=115P - CAPI2757 - Columbine Bldg - 1845 Sherman Bas...	6:39p
RTDsidewalkGalbreathTower.101@xcelenergy.com	VaultGard Event Report { Trip Event } ID=7195 Event=Alarm Active Device=832P - CAPI2757 - RTD Sidewalk - 1550 Broadway Time...	6:39p
UnitedBankSidewalk.93@xcelenergy.com	VaultGard Event Report { Trip Event } ID=4485 Event=Alarm Active Device=860P - CAPI2757 - United Bank - 1750 Lincoln - Sidewal...	6:39p
ColoStateBankBasement.102@xcelenergy.com	VaultGard Event Report { Trip Event } ID=10381 Event=Alarm Active Device=087P - CAPI2757 - Colo State Bank - 1620 Broadway - B...	6:39p
LincolnCourt1580BasementParking@xcelenergy.com	VaultGard Event Report { Trip Event } ID=5791 Event=Alarm Active Device=496P - CAPI2757 - Lincoln Court - 1580 Lincoln Baseme...	6:39p
LincolnCenterRoof@xcelenergy.com	VaultGard Event Report { Trip Event } ID=4248 Event=Alarm Active Device=080P - CAPI2757 - Lincoln Center - 1690 Lincoln Roof T...	6:39p
LincolnCenterP1Garage.98@xcelenergy.com	VaultGard Event Report { Trip Event } ID=3697 Event=Alarm Active Device=950P- CAPI 2757- Lincoln Center P1 Garage Time=05/2...	6:39p

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.



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.

Step #3 – Download Event Log



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Event

View the log

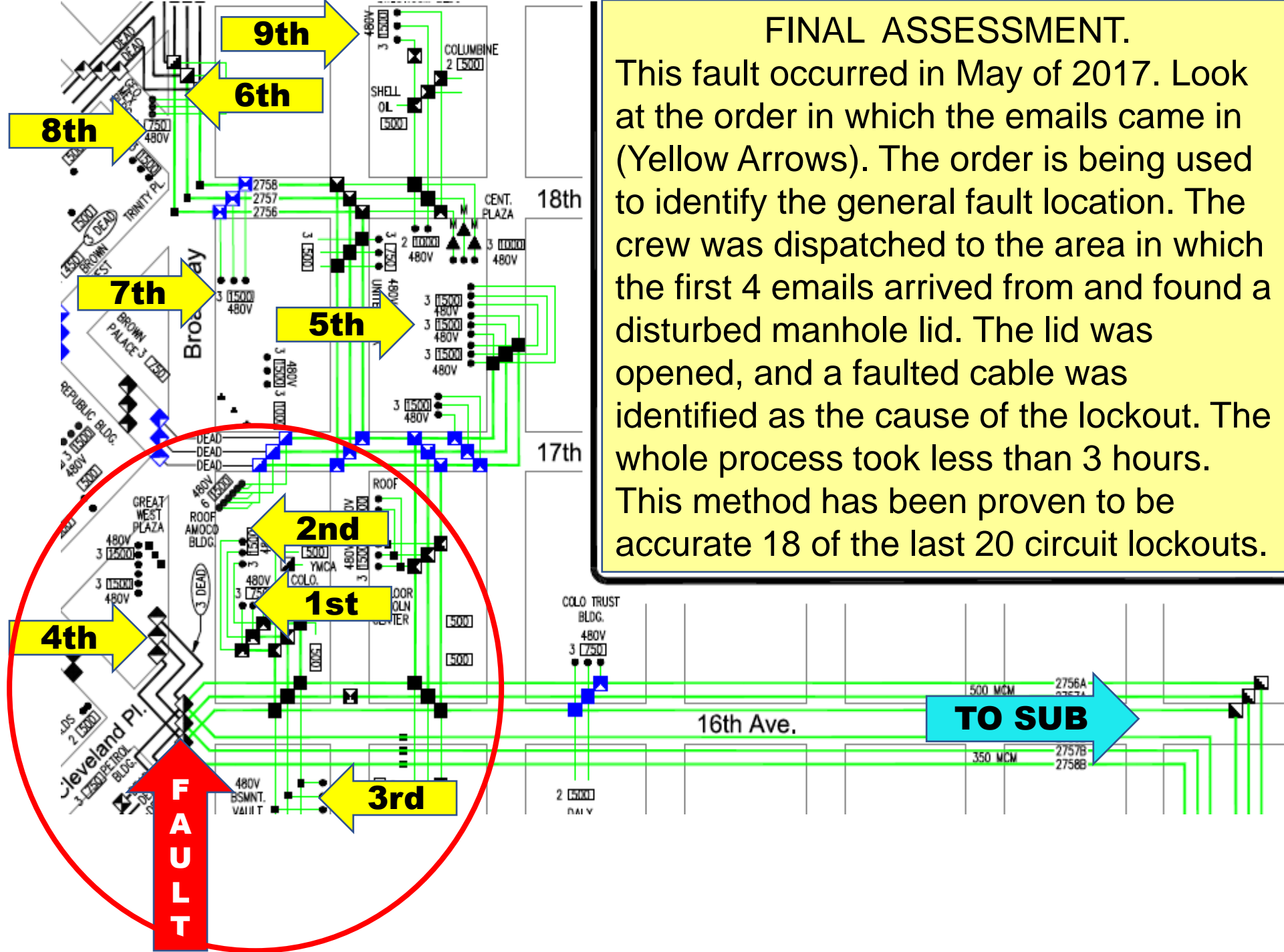
Erase the log...

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 spreadsheet.

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





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