QUANTA TECHNOLOGY

A QUANTA SERVICES COMPANY

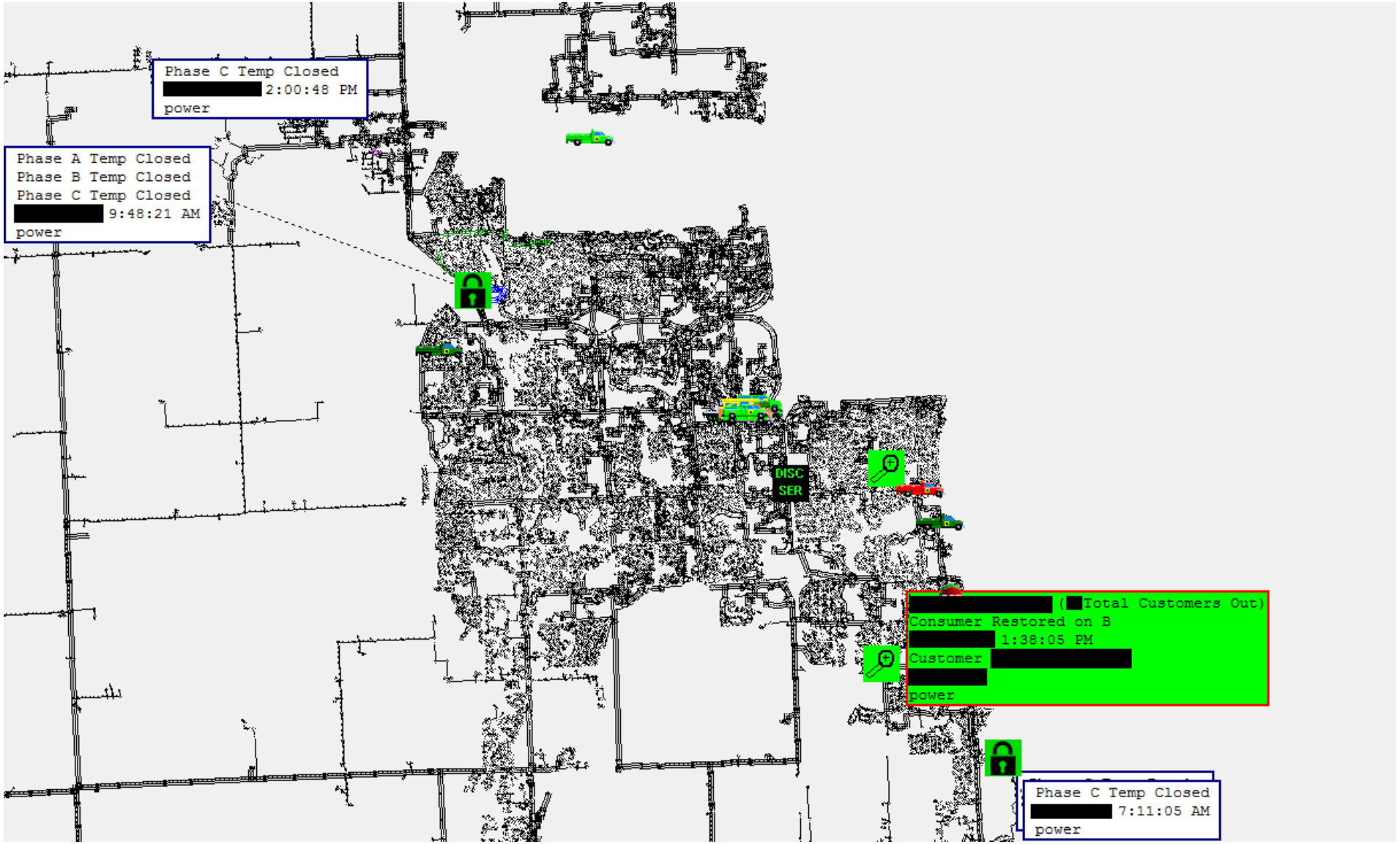
WE ARE QUANTA

World-Class People. Unmatched Execution.

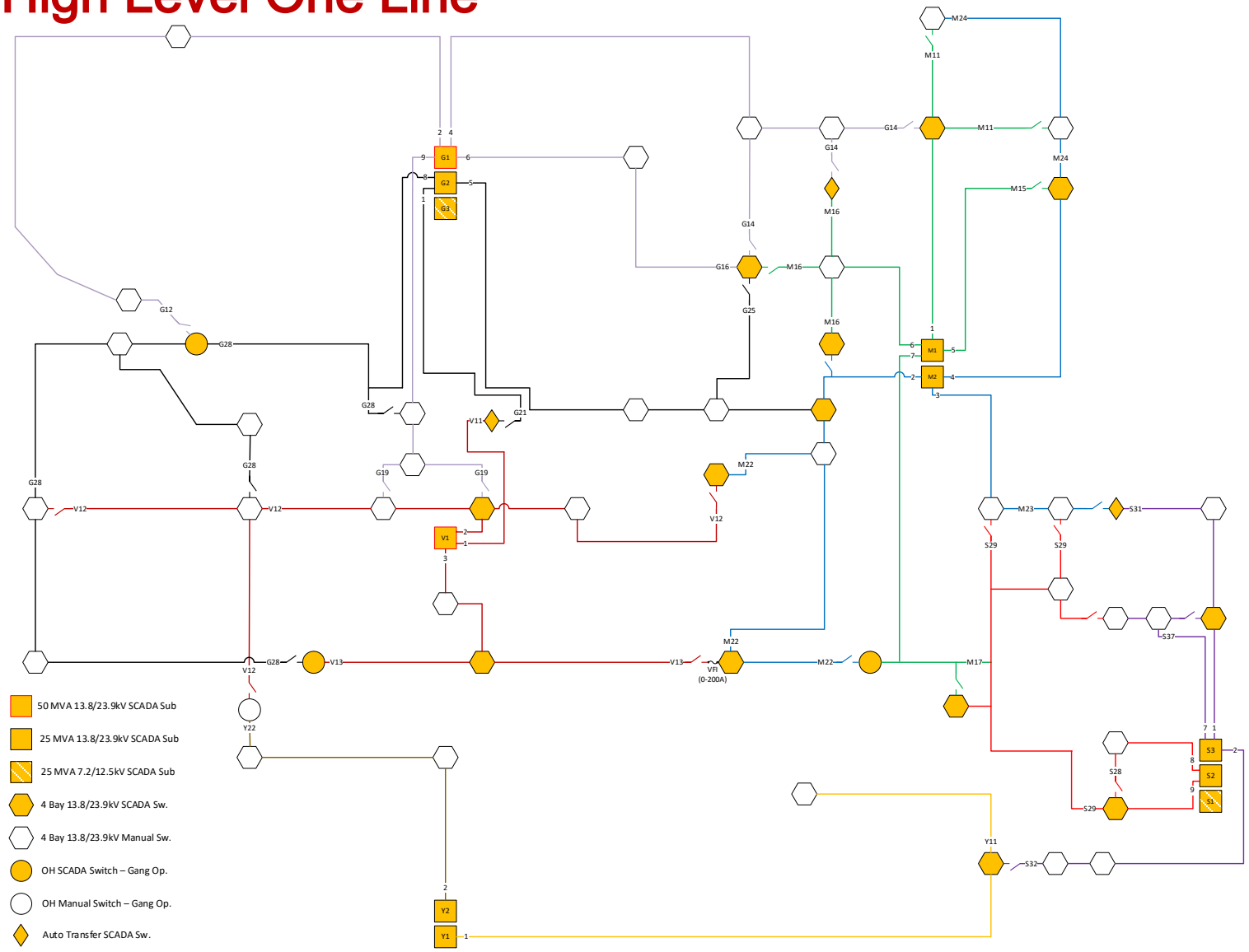
PMU PERSPECTIVE

Distribution System Operator

Urban Distribution Connectivity Model



High Level One Line



40K Meters

24 Feeders

200 Pad Mount Switches

Tens of Thousands of Transformers

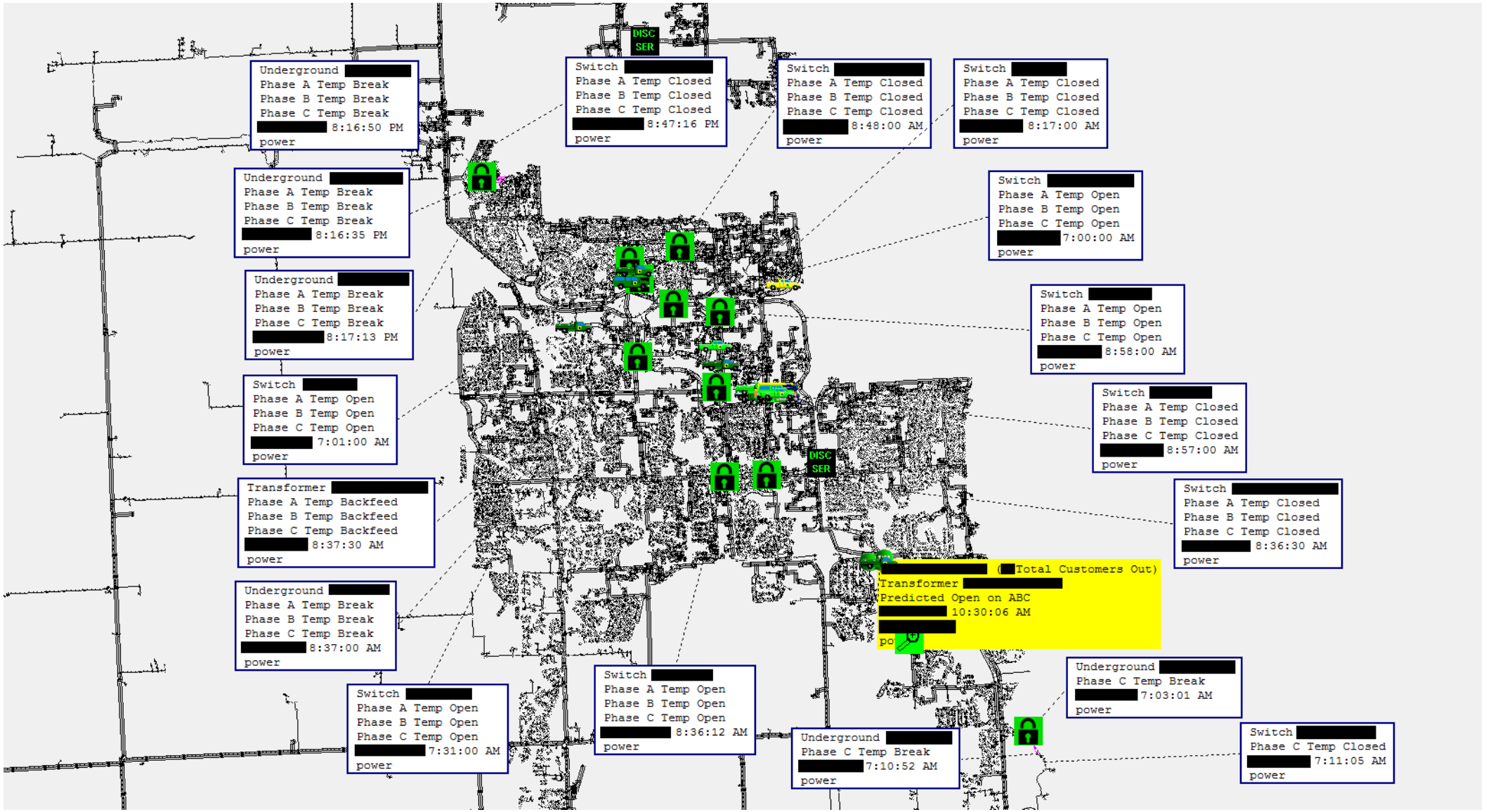
Tens of Thousands of medium voltage junctures

Fractional % provisions for instrumentation

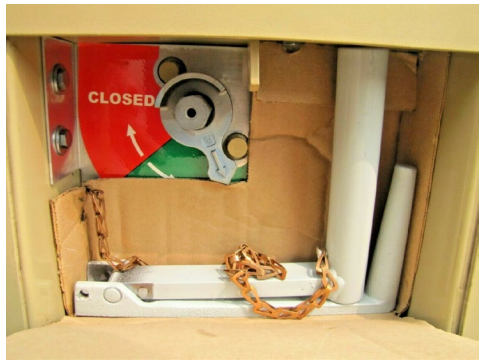
One Feeder & Alternates

- Parent:Child Relationships
- Definitions of Assets
  - Sub/Bus/Feeder/Phase
- Definitions Change
- Normal vs Abnormal
  - …Iterative

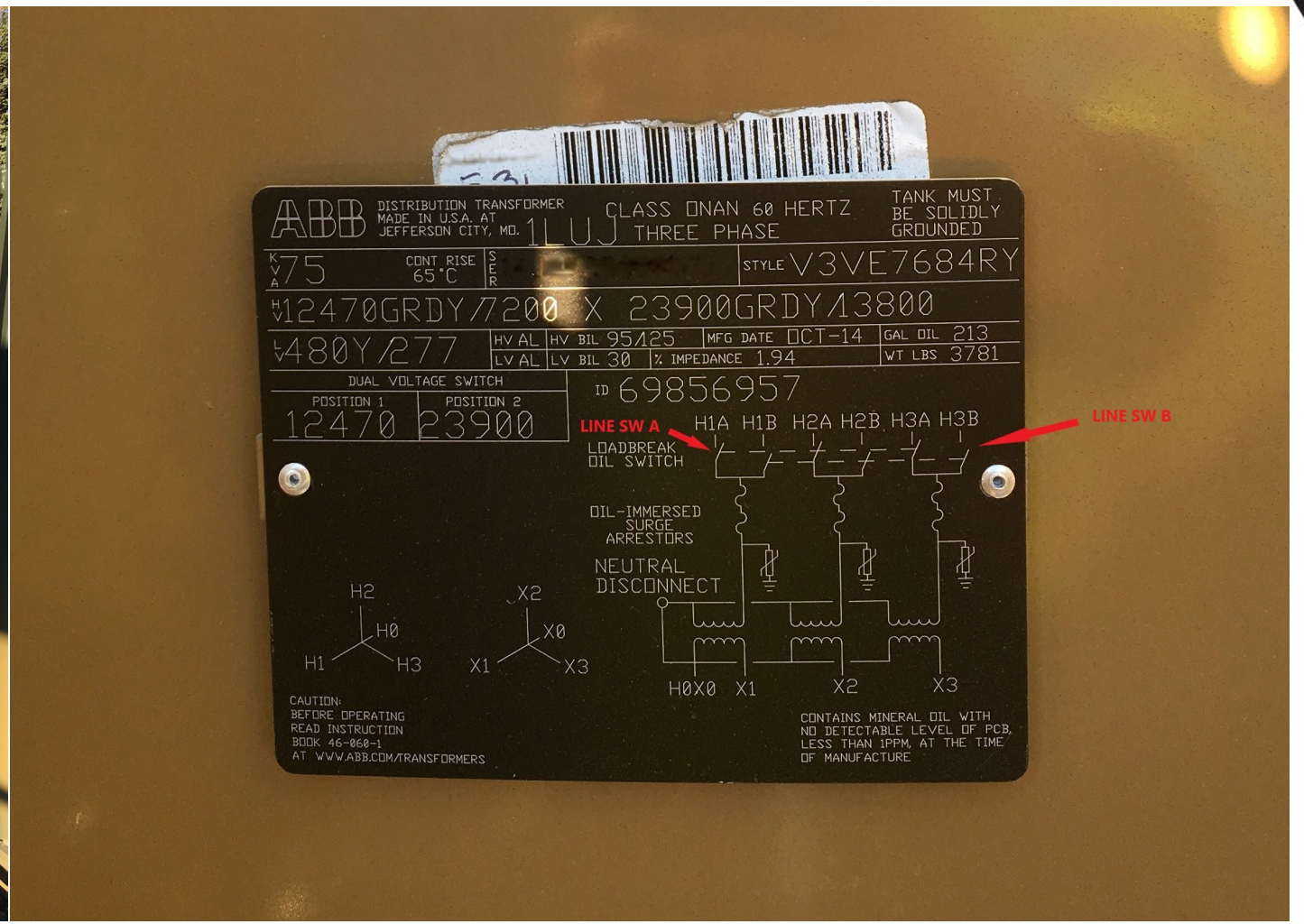
Monday Morning



Medium Voltage Nodes – Switches/Elbows



Medium Voltage Nodes - Transformers



Distribution Switching Example & Quantity

Engineering and Operations

Date:

To: Power Control, Linecrew

From:

Re: Switching to isolate cable to cut in junction box and change feeds to lift station. Outage is scheduled from 9-11 a.m. on .

1. Power Control get permission to tie S #2 and #3
2. Power Control set regulators on S #2 and #3
3. Set VFI going south/west in switch A to 200A
4. Close tie in transformer B
5. Open going north in transformer C
6. Pull and park A, B, C phase elbows going south in switch A
7. After new junction box is cut in and ready to move east feed out of transformer C, move on to step 8, there will be an outage for Z meters.
8. Open B phase going north out of transformer B
9. Open A phase going east out of transformer D
10. Open C phase going east out of transformer E
11. Pull and Park A, B, C phase elbows going east and west on feed thru insert on transformer C
12. Remove feed thru insert in transformer C
13. Plug back on cables feeding west in transformer C

Note: Power control check for any hold tags in area.

Back to normal:

1. Make sure VFI going south/west in switch A is set to 200A
2. Power Control get permission to tie S #2 and #3
3. Power Control set regulators on S #2 and #3
4. Plug on A, B, C phase elbows going south in switch A
5. Close B phase going north in transformer B
6. Close A phase going east in transformer D
7. Close C phase going east in transformer E
8. Close in going north at transformer C
9. Open back at normal open going north in transformer B

Day of Week	Day Offset	Quantity of Meters Impacted
Monday	DAY	7916
Sunday	DAY -1	0
Saturday	DAY -2	0
Friday	DAY -3	1122
Thursday	DAY -4	2
Wednesday	DAY -5	3850
Tuesday	DAY -6	9115
Monday	DAY -7	0
Sunday	DAY -8	0
Saturday	DAY -9	0
Friday	DAY -10	0
Thursday	DAY -11	0
Wednesday	DAY -12	0
Tuesday	DAY -13	1
Monday	DAY -14	4
Sunday	DAY -15	0
Saturday	DAY -16	0
Friday	DAY -17	4
Thursday	DAY -18	582
Wednesday	DAY -19	0
Tuesday	DAY -20	1
Monday	DAY -21	592
Sunday	DAY -22	0
Saturday	DAY -23	0
Friday	DAY -24	0
Thursday	DAY -25	0
Wednesday	DAY -26	0
Tuesday	DAY -27	0
Monday	DAY -28	367
Sunday	DAY -29	0
Saturday	DAY -30	0
Friday	DAY -31	182

Extra Stats

HOW TO QUANTIFY

Switching

Consider how to quantify distribution switching, and give thought to how switching impacts your work. Remember that Medium Voltage Live Line Work Practices dictate that nodes will be added to 120V – 34.5 kV infrastructure as needed, including mid-span (i.e. cutting in a Hoist)…which takes 5 minutes.

- Thousands to Tens of Thousands (minimum #) of meters change their Sub/Feeder/Phase changes per day

Utility 2

1-5M Meters

- 16,000 Temp Ops in OMS in 9 months
- 8,000 at a SCADA device
- 8,000 at non-SCADA devices

Utility 3

1-5M Meters

Quanta Technology

2023 Locations

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