

Improving Resilience and Reliability of Network Feeders

Medium Voltage Interrupters for Fault Isolation and Identification

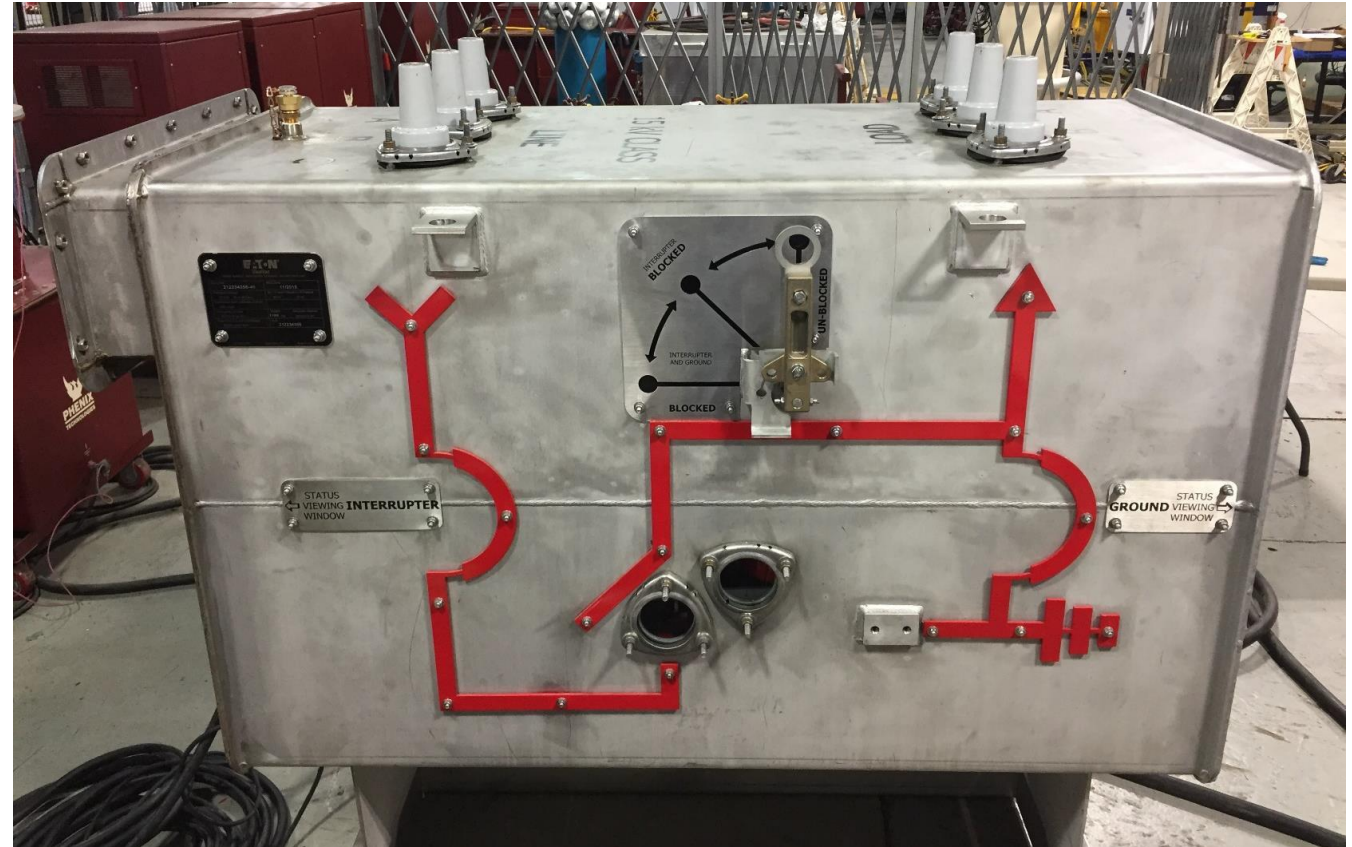
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Department Manager

September 14, 2022

Agenda

- Con Edison
- Medium voltage interrupter
- Bifurcated Feeder Success
- Future Applications



Con Edison System



604 square miles (40% island)

3.5 million customers / 9 million people

75% secondary mesh network

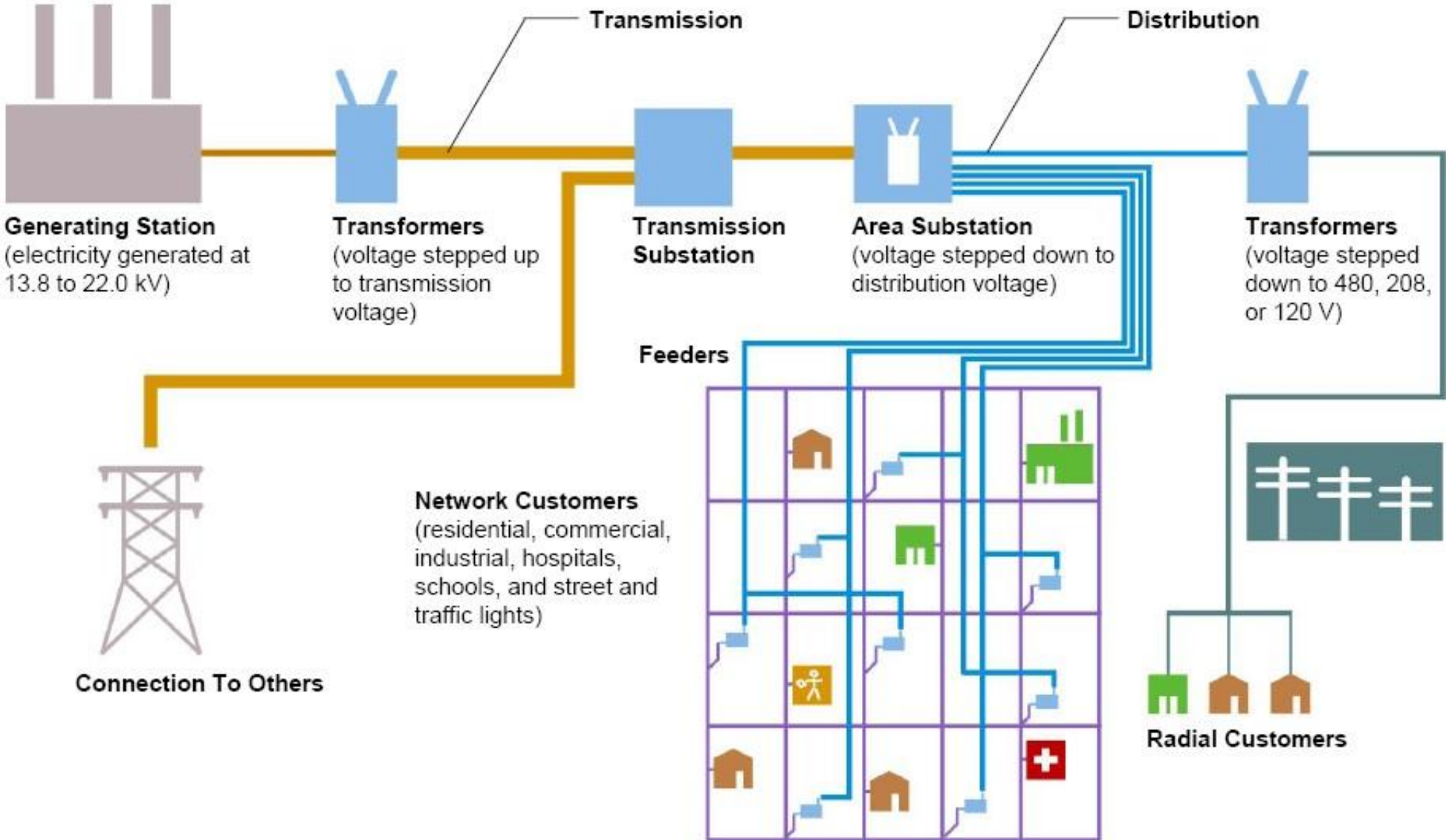
2,200 distribution feeders

28,000 network transformers

97,000 Miles of UG cable

Over \$1 Trillion GDP (5% of US GDP)

Con Edison: Second Contingency Design



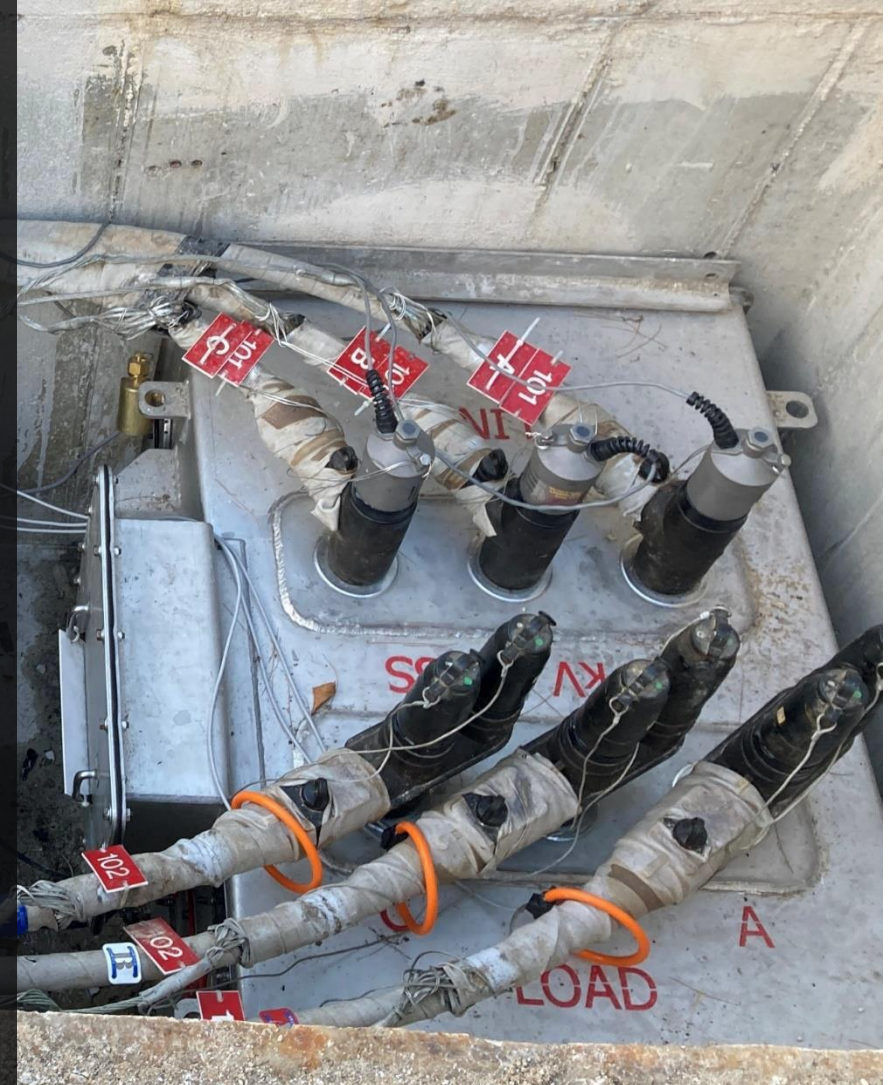
Medium Voltage Interrupter



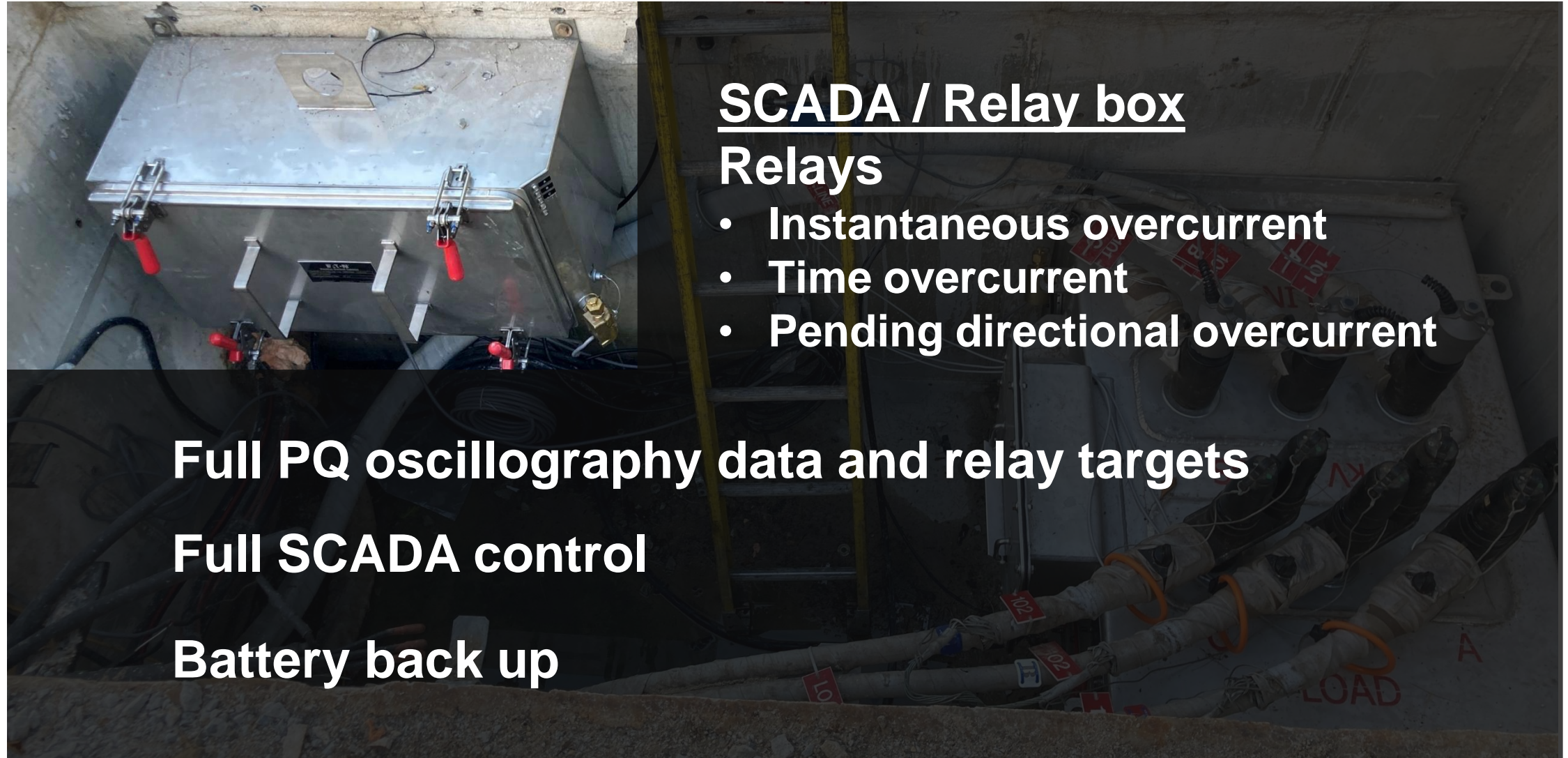
Medium Voltage Interrupter

Interrupter Switch

- Vacuum bottles interrupt
 - 40kA for 15kV class
 - 31.5kA for 27kV class
- Lindsey voltage sensors ($\pm 1\%$)
- Rogowski coils ($\pm 1\%$)
- More accurate PQ data



Medium Voltage Interrupter



SCADA / Relay box

Relays

- Instantaneous overcurrent
- Time overcurrent
- Pending directional overcurrent

Full PQ oscillography data and relay targets

Full SCADA control

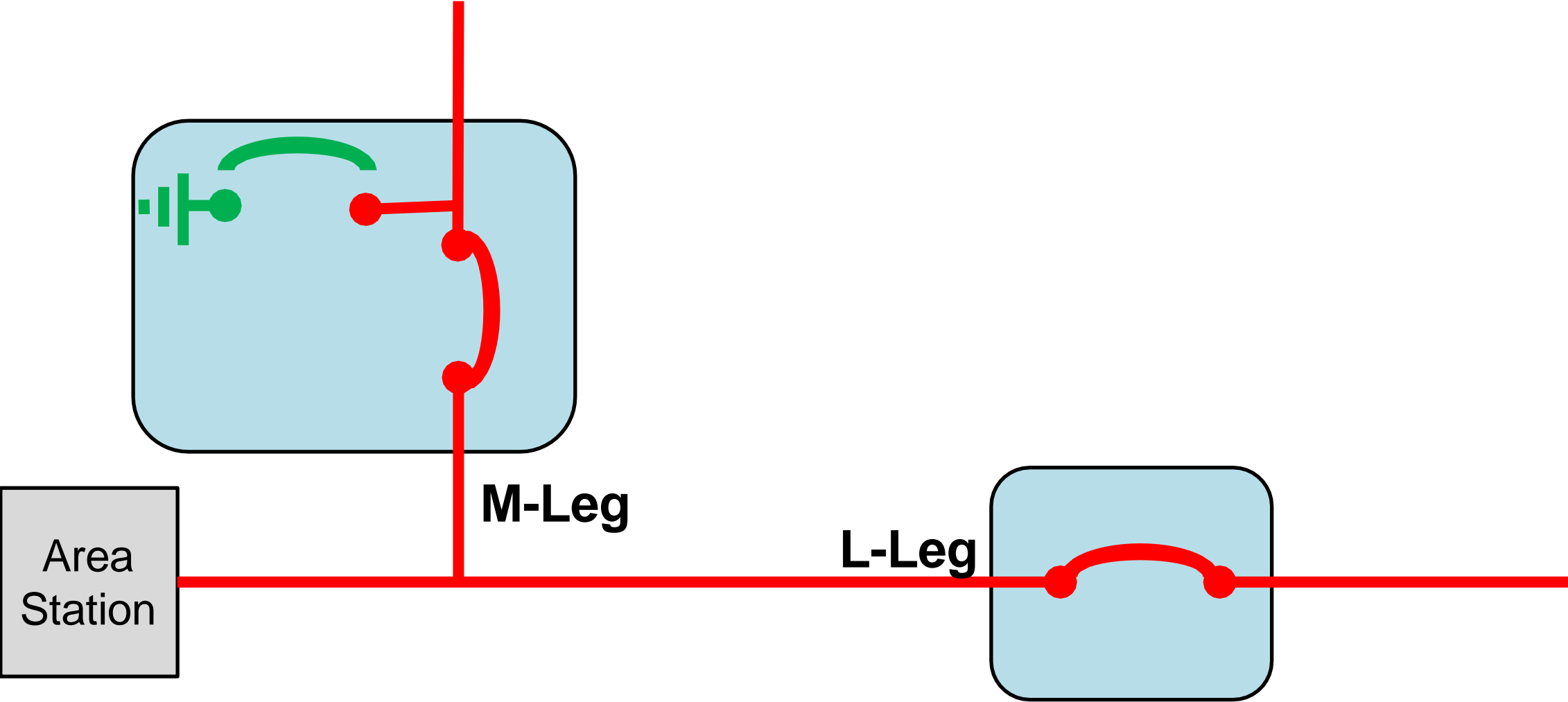
Battery back up

Medium Voltage Interrupter

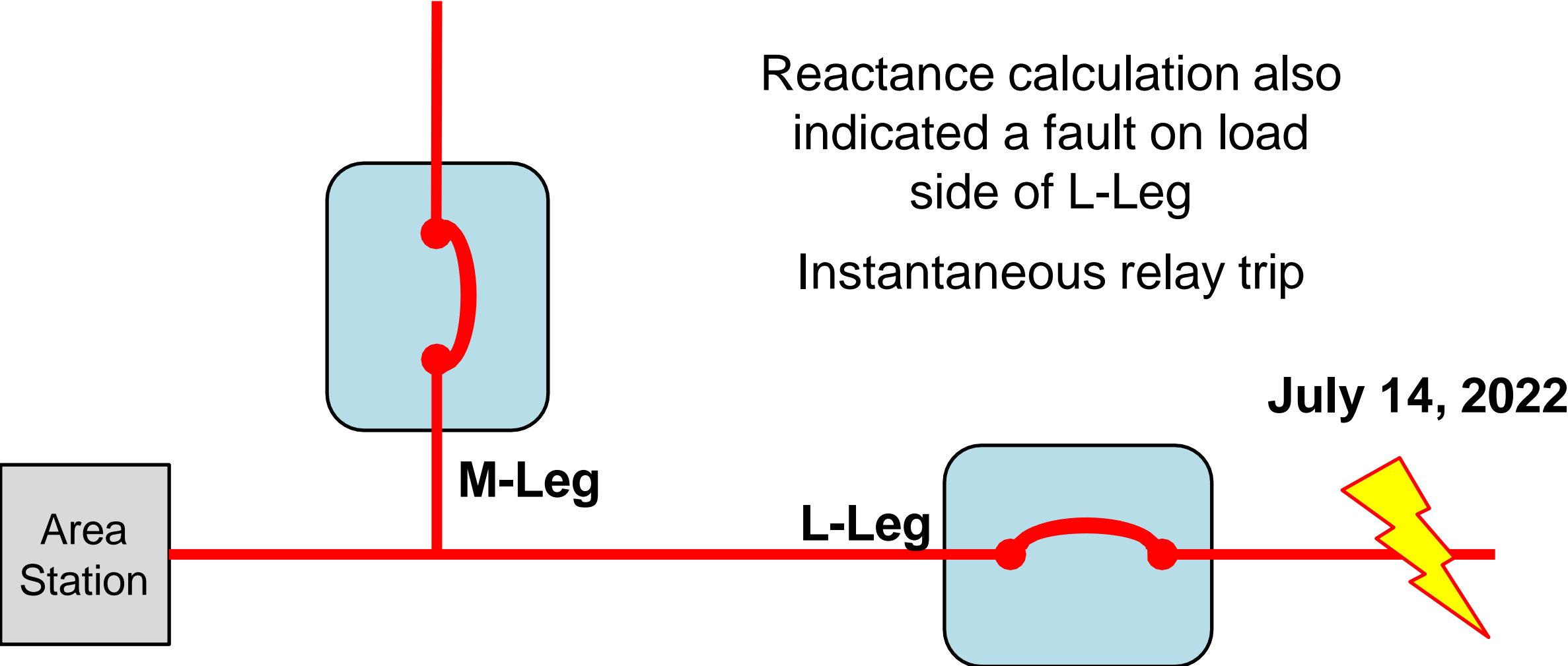
- Visible break (Pending)
- Grounding capability
 - Can be used to clear backfeed
 - 15kV class/40kA
 - 27kV class/31.5kA
- Fault finding and processing from interrupter/cam op



Bifurcated Feeder Success



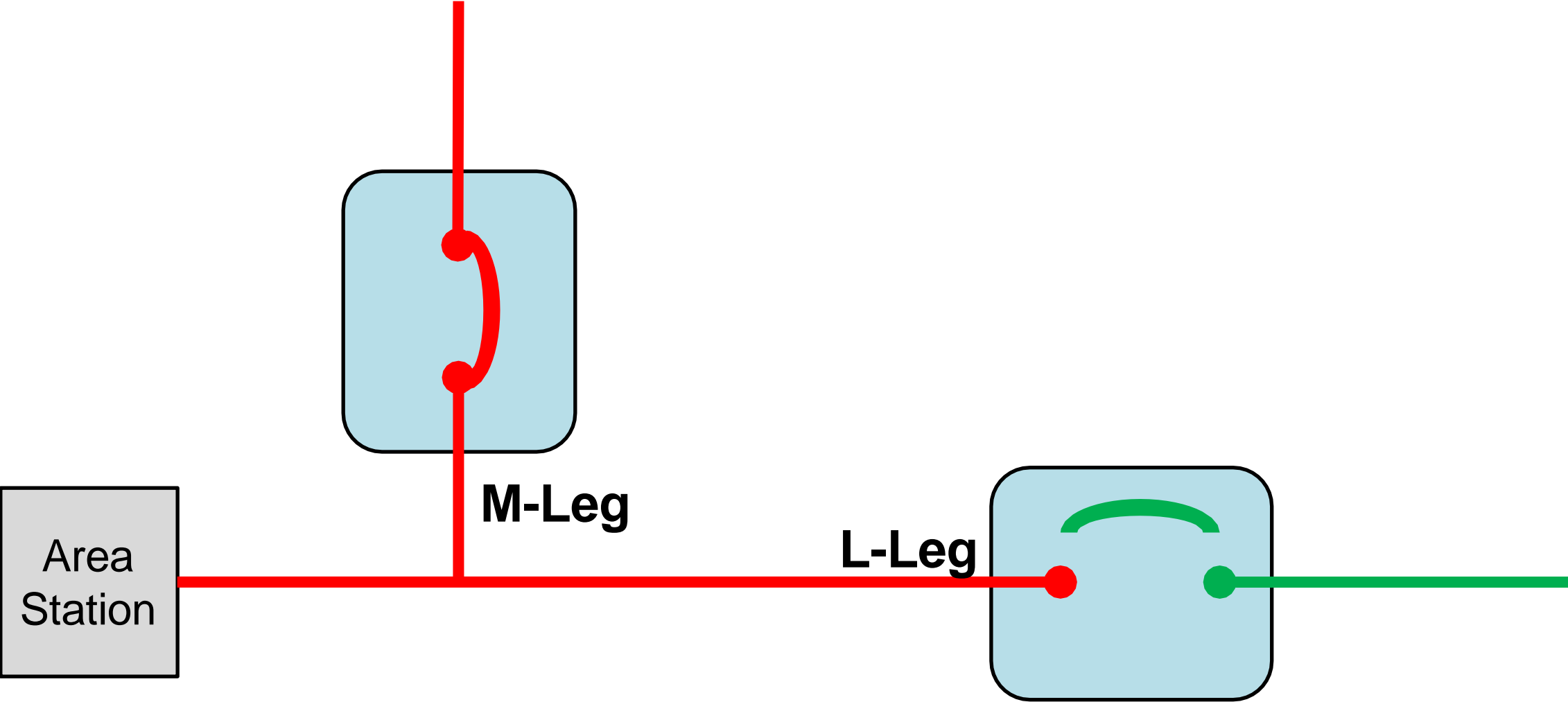
Bifurcated Feeder Success



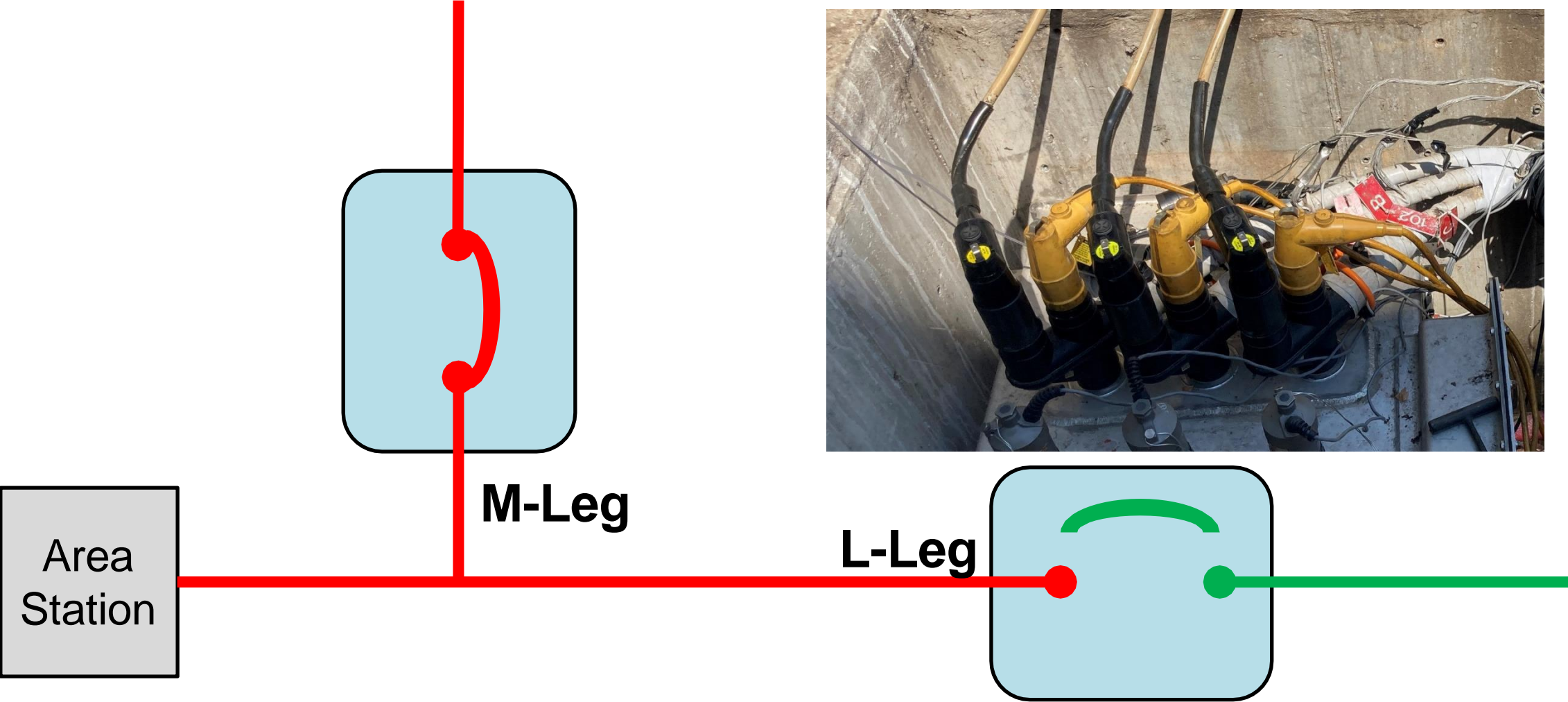
Reactance calculation also indicated a fault on load side of L-Leg
Instantaneous relay trip

July 14, 2022

Bifurcated Feeder Success



Bifurcated Feeder Success

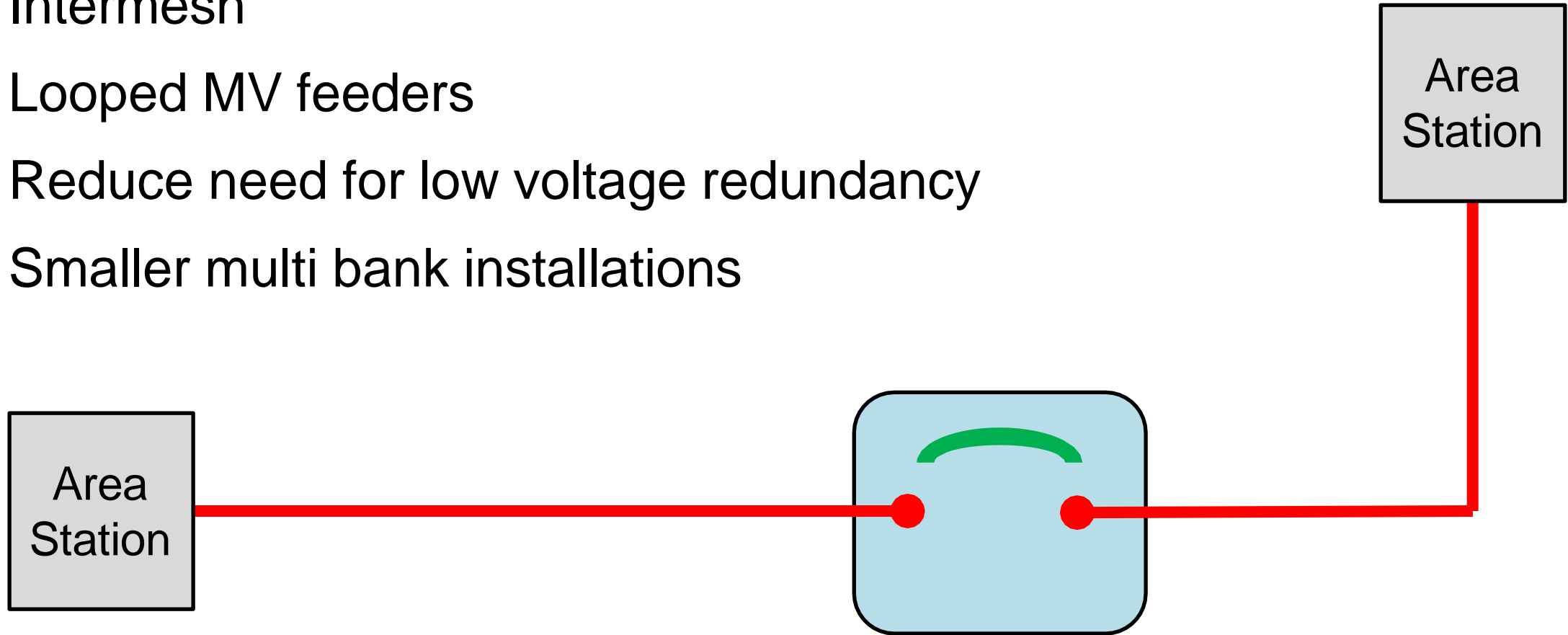


Design Iterations

- Mechanically protect current sensors and cables
- External Cam-Op style visible break
- External interlock redesign (SCADA/relay box)

Future Applications

- Intermesh
- Looped MV feeders
- Reduce need for low voltage redundancy
- Smaller multi bank installations



Questions?

