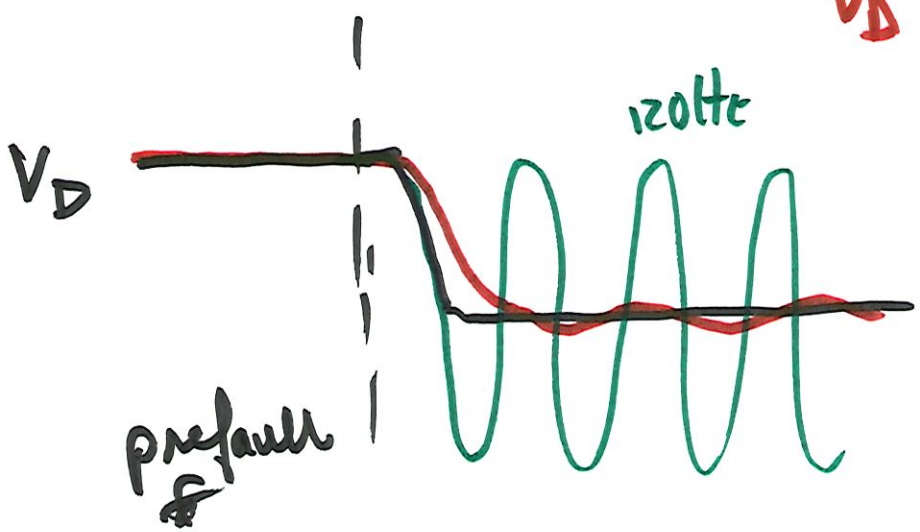
University of Idaho

ECE 529
Utility Applications of Power Electronics

Session 26

Unbalanced fault?

- V_D → how impacted
  - Decreased V_{pos} (V_1) → V_{D1} ↓
  - Increased V_{neg} (V_2) → 2f term (120Hz)
  - V_0 has no impact on V_D



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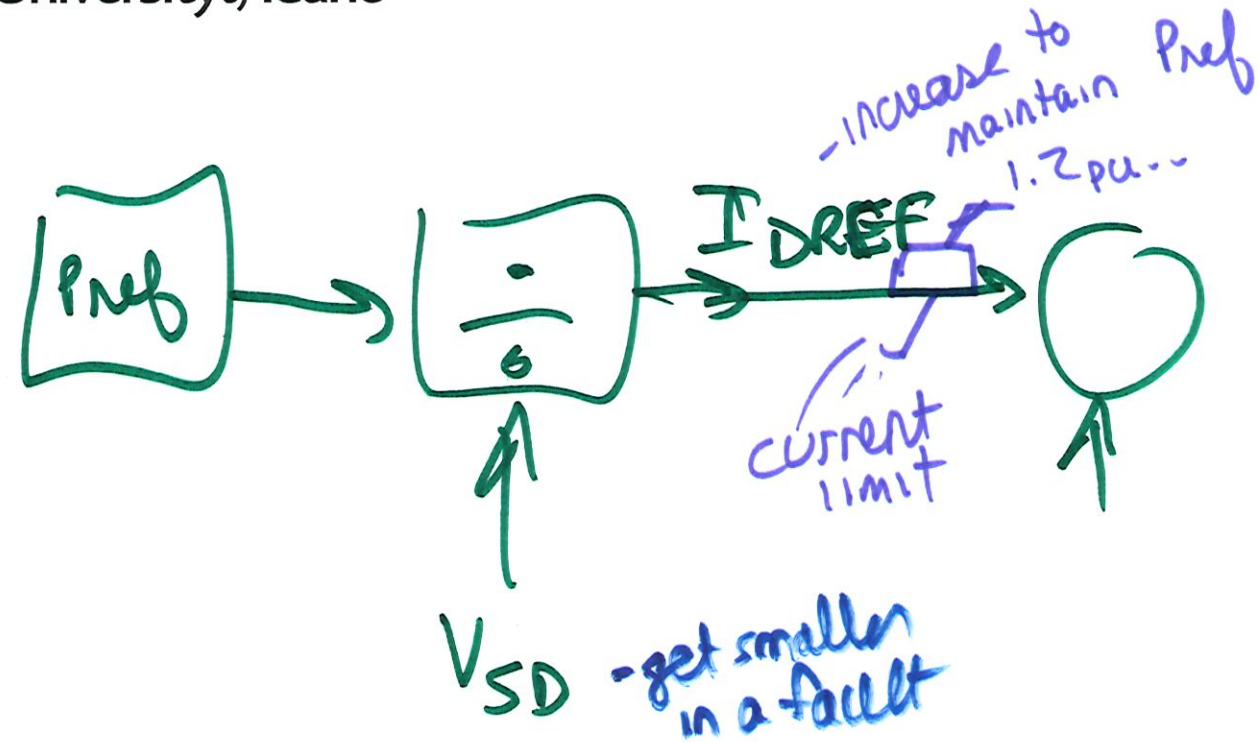
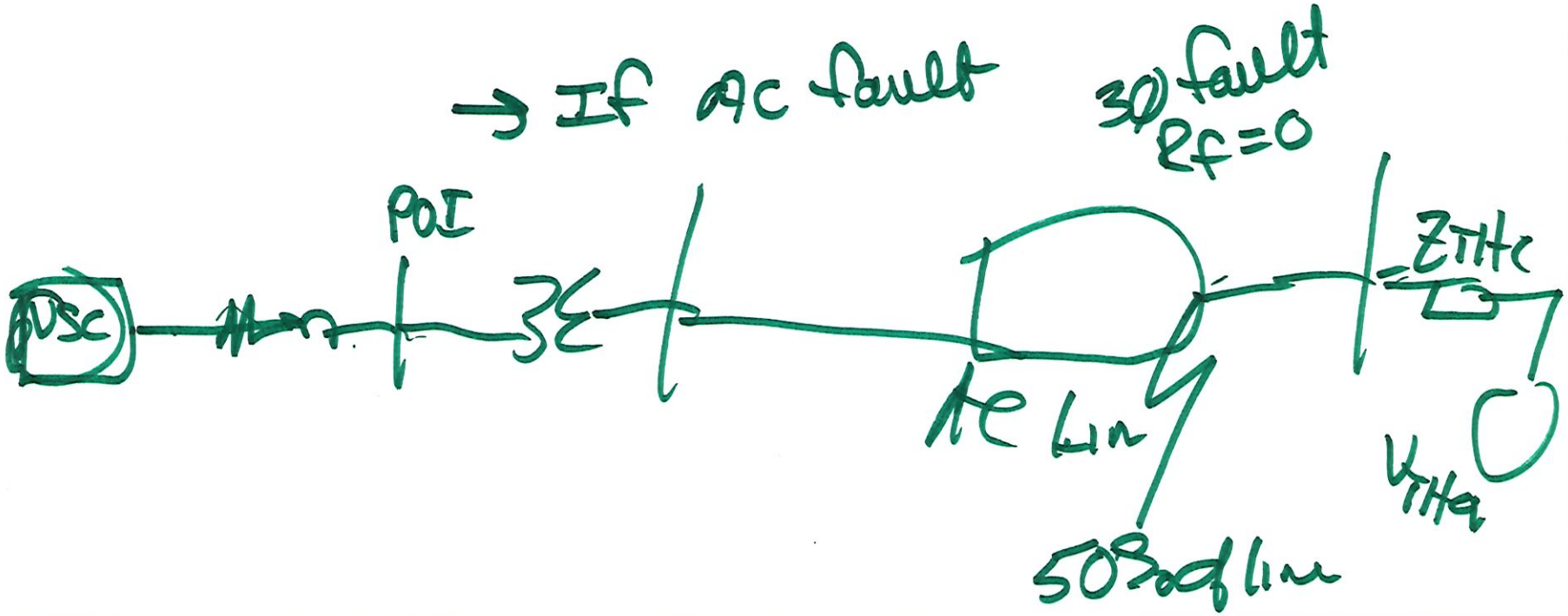


→ If AC fault



IEEE 2800

→ Rules on $|I_2|$ and θ_{I2} relative to θ_{V2}

→ I_{dref2}, I_{qref2} } negative

I_{dref1}, I_{qref1} } positive

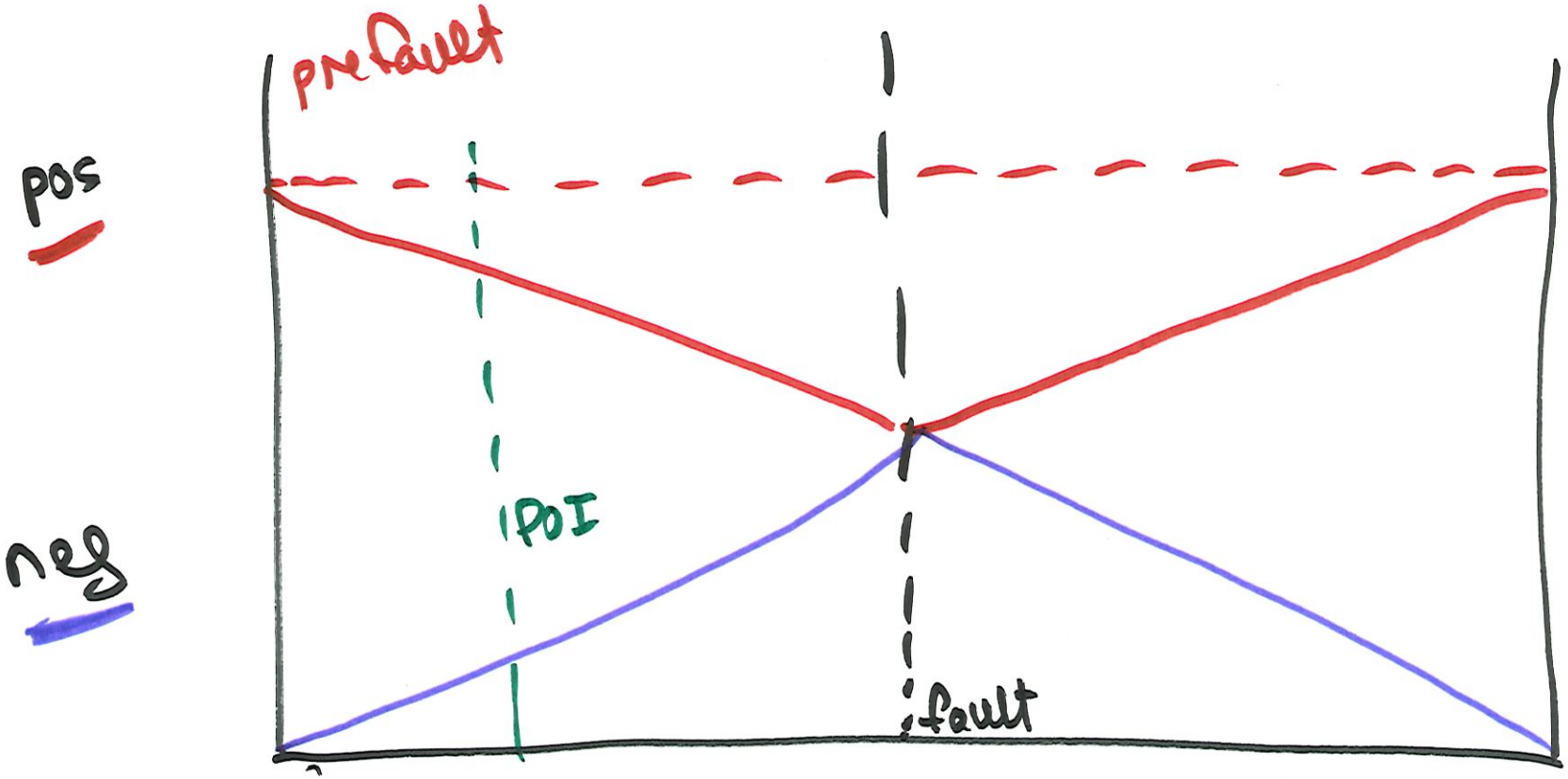
→ Also requirement to provide reactive power

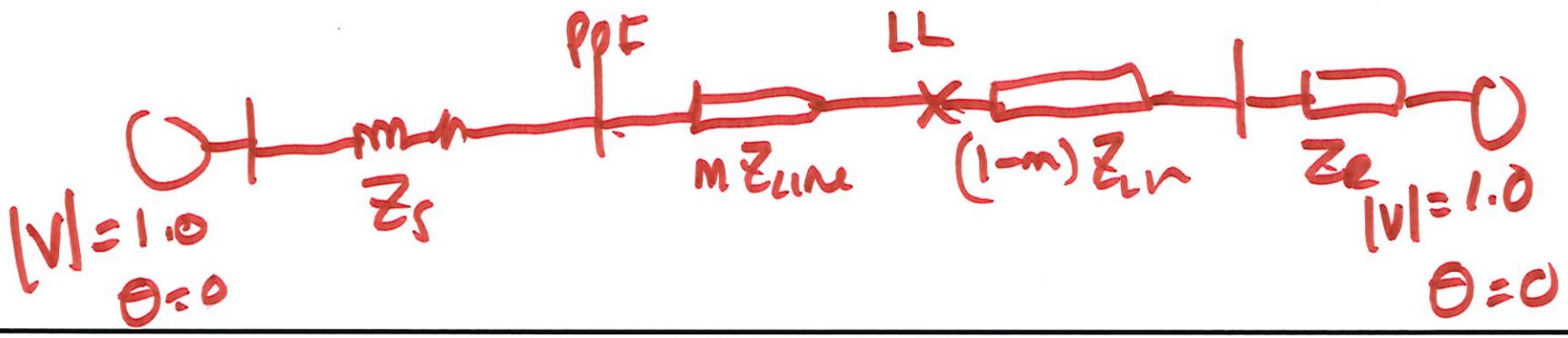
- increases voltage locally

① After cleared

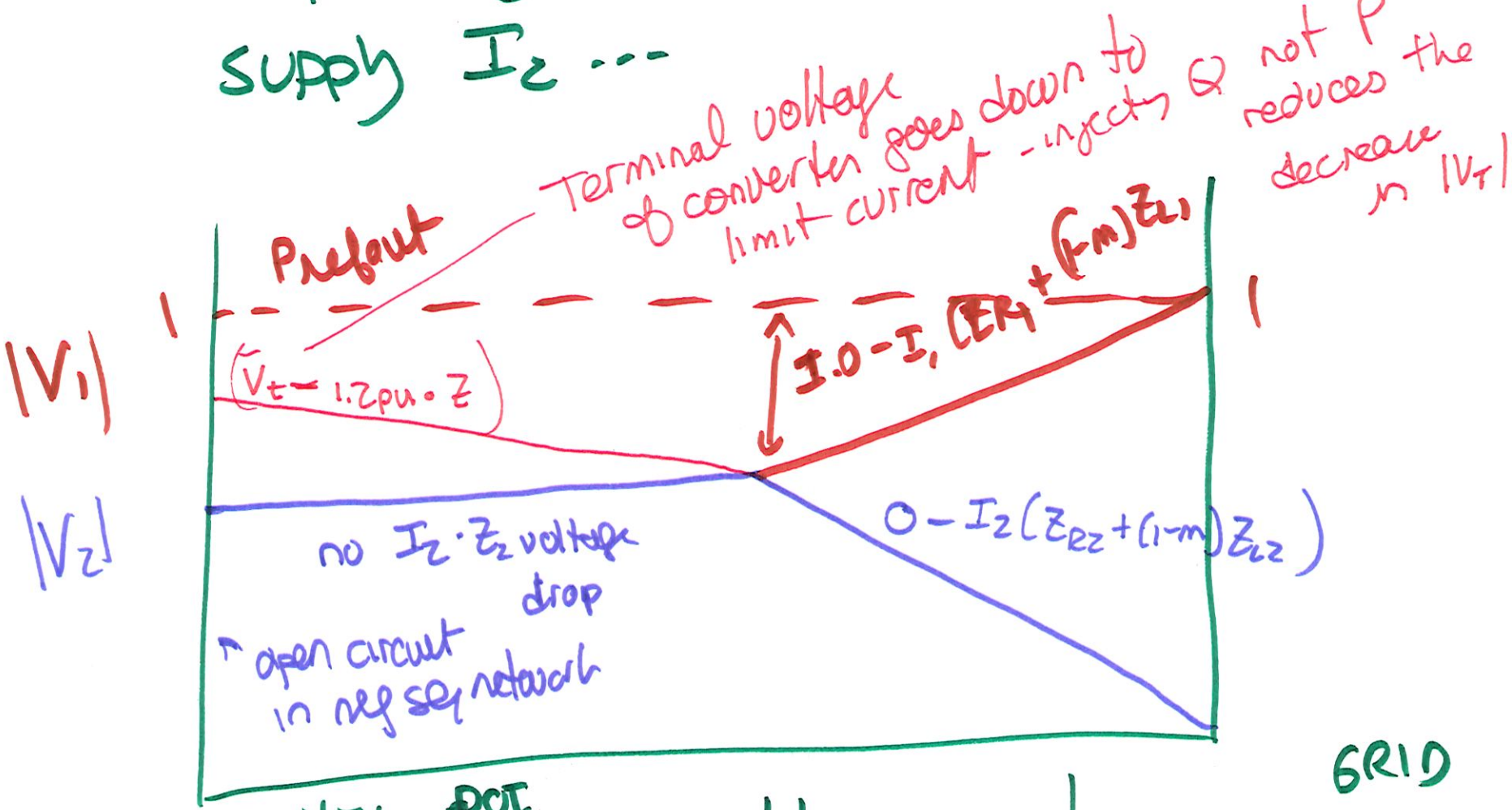
② Help converters meet voltage ride through rules

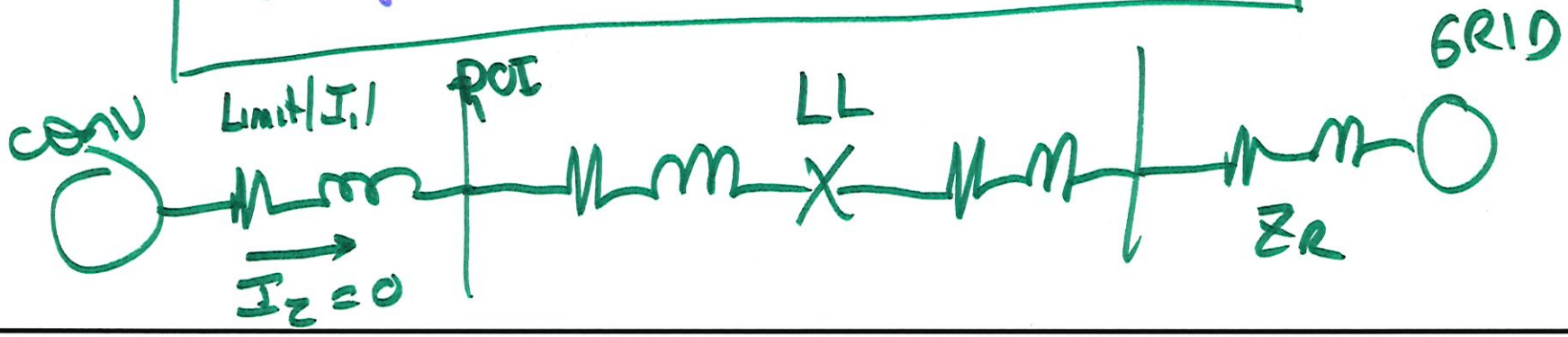
Voltage response for unbalanced fault



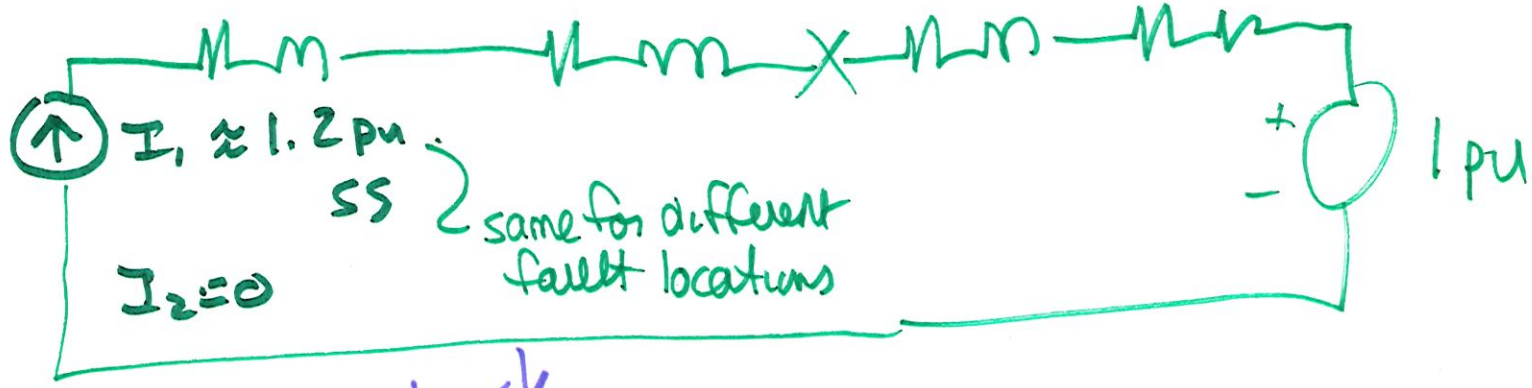


Impact of converter not supply I_2 ...

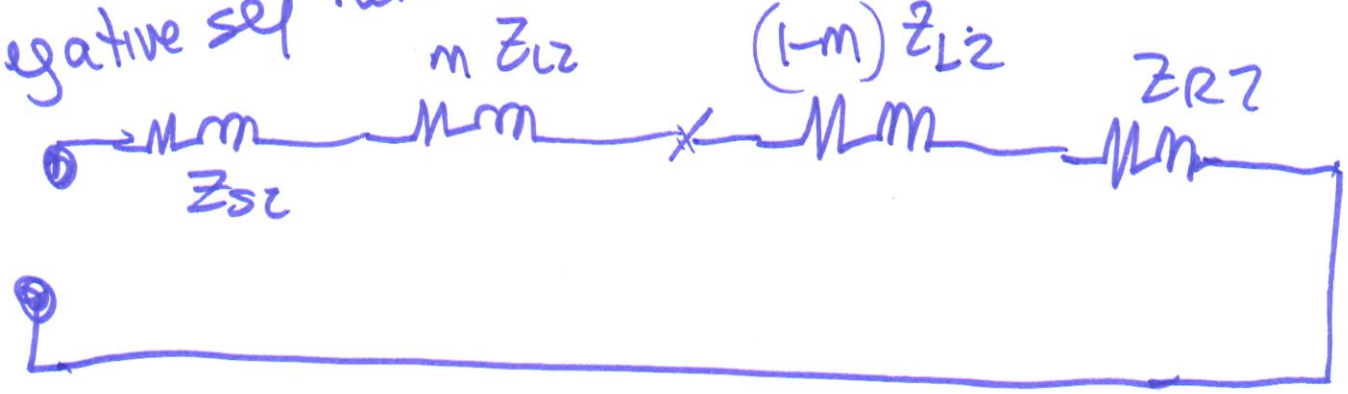




converted with radial system

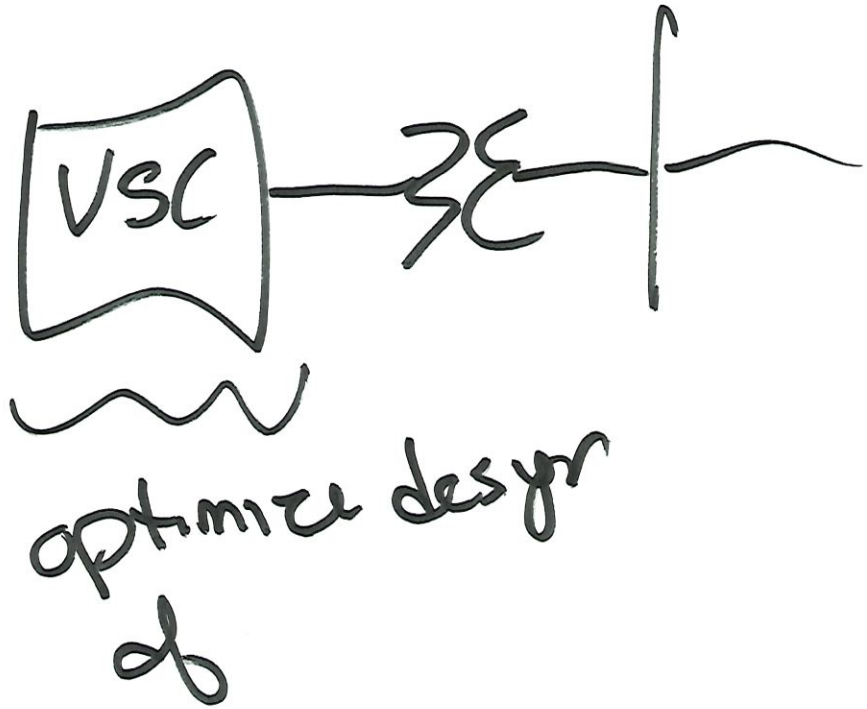


Negative seq network



- Std 2800 requires supply I_2 to improve protective relay performance

- converter current prioritization
  - during fault
    - → Q to boost volt
    - I_2
    - P



- Grid following converters
- Grid forming converters — response is more "flexible"

can - program to respond like synch. gen.