

ECE 444 / ECE 544 /

CS 444 / CS 544

Supervisory Control and Critical Infrastructure Systems

Session 3

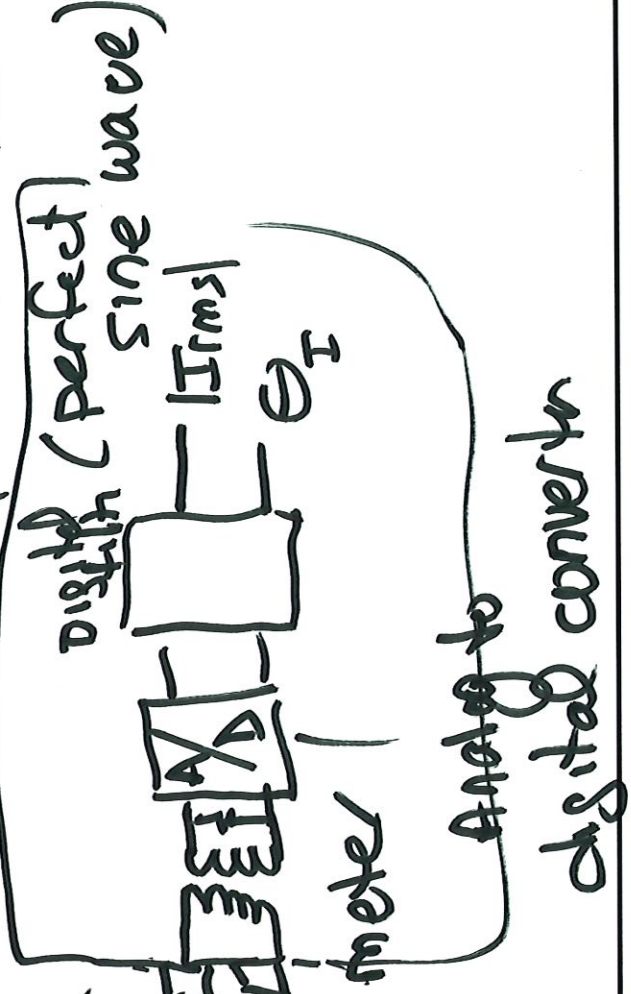
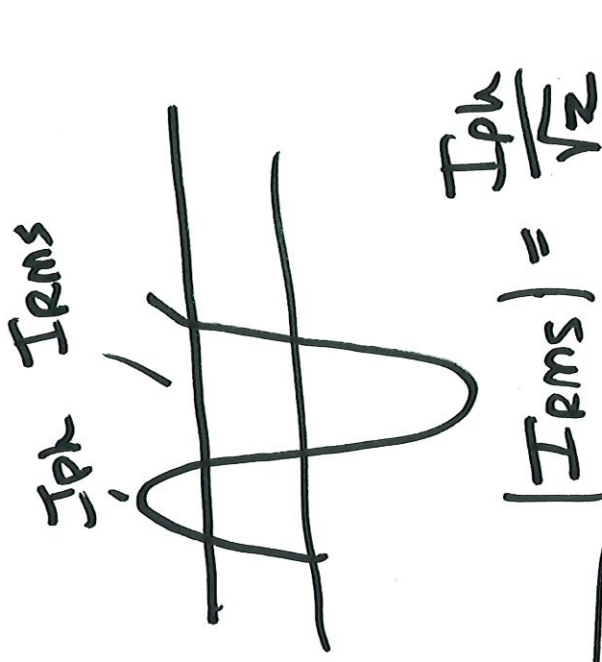
Current Measurement



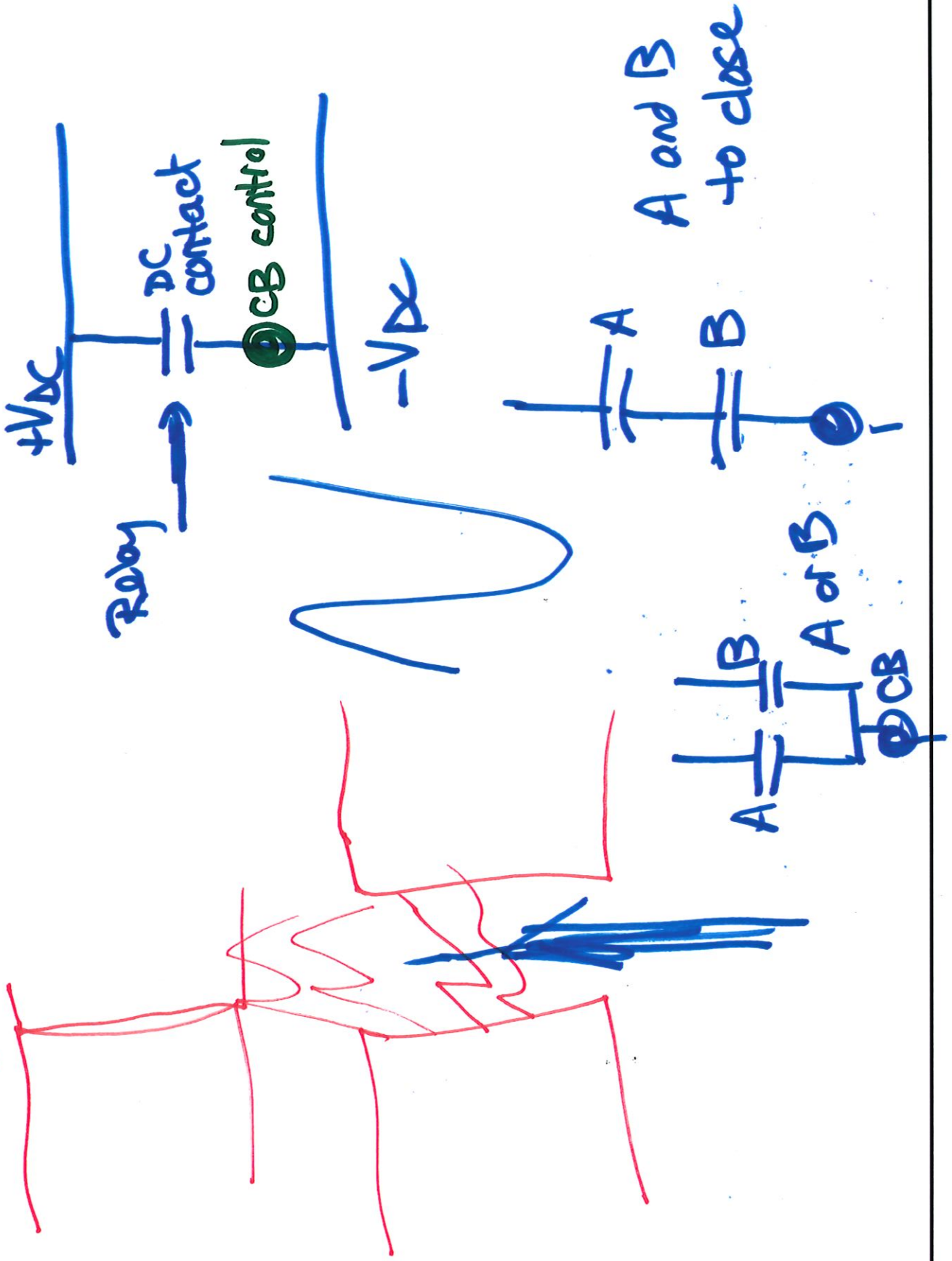
5A under maximum load conditions

~~Current~~ Current transformer (CT)

~~AA~~ circuit symbol for CT



Circuit Breaker

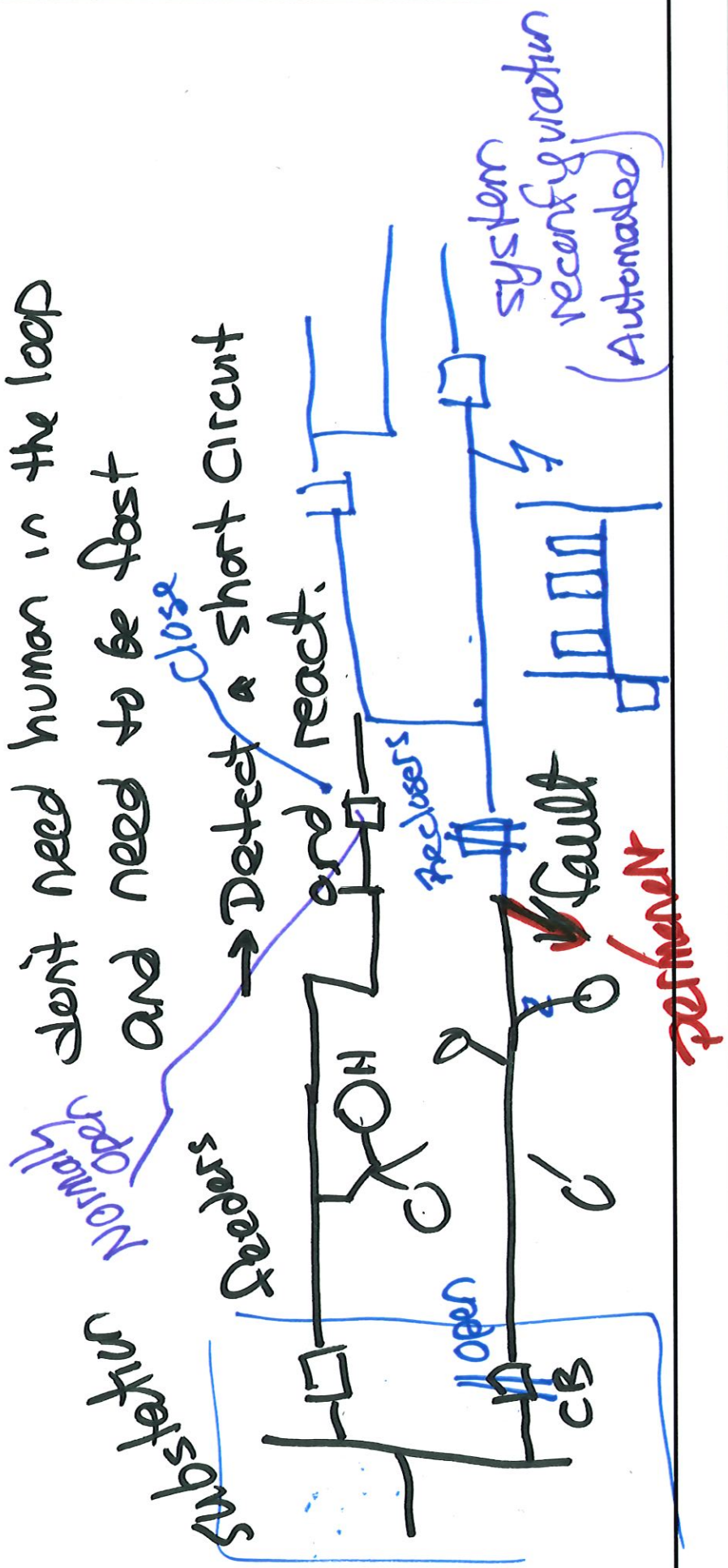


Data Processing & Action

Local level

In the substation

Actions or decisions that
don't need human in the loop
and need to be fast



- central level data processing
and central

- collect measurements
from system as a whole

→ SCADA (or similar)

→ optimize system
operation ⇒ lowest cost
⇒ efficiency
⇒ Reliability

- some autonomous
some with human in the loop

3. Display of Information

→ Local HMI (human machine interface)

→ available if

some enters station

⇒ minor ~~is~~ this is a central control center

→ system level control center
HMI

→ Status

→ Alarms

→ Ability to take actions

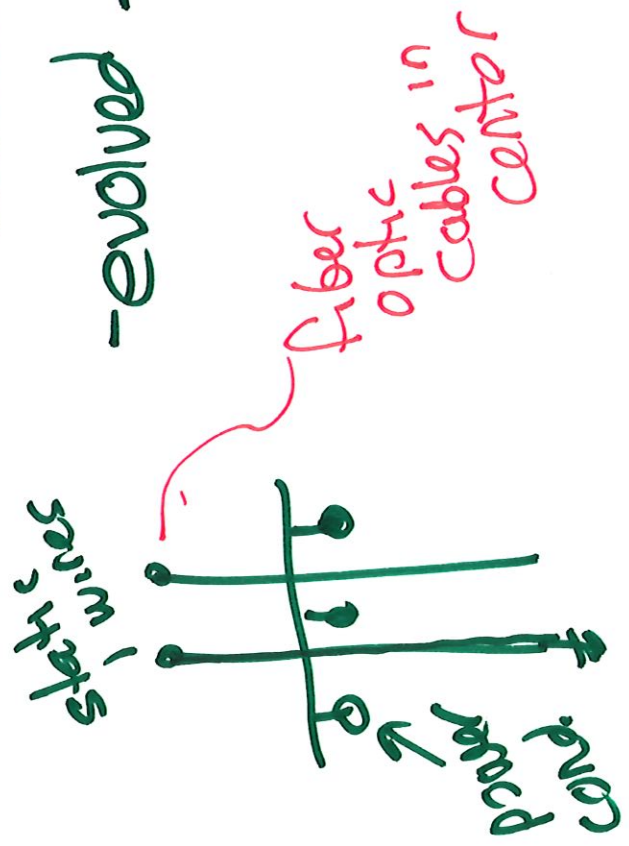
Human factors engineering

4. Communication

- connect remote stations
to central control center]
dedicated network

SCADA

- evolved → mostly utility owned
- some leased lines



- multiple levels of communication networks

