

ECE 525: Lab 3

Bus differential protection

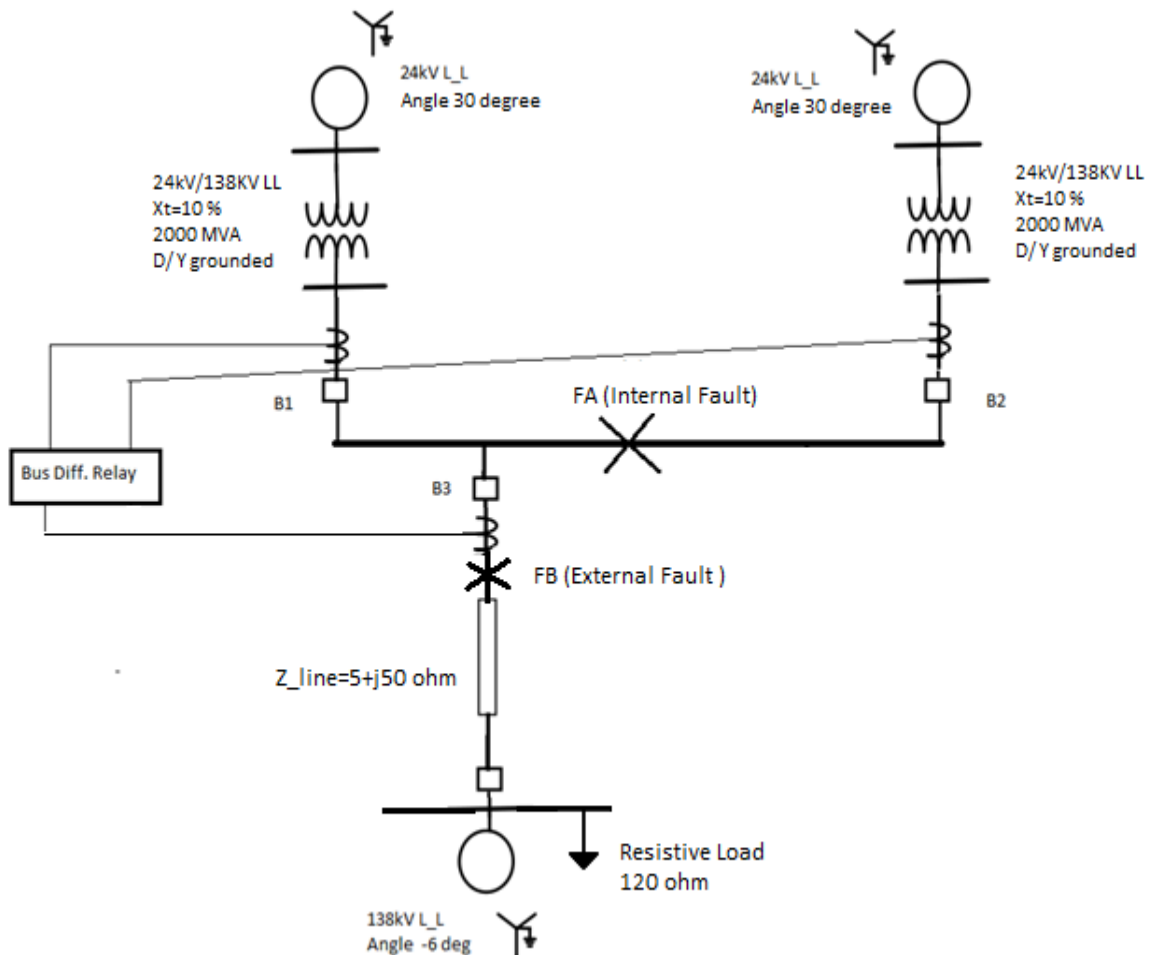
Due Session 30, December 10

Lab Objective:

- Learn the principles of bus differential protection.
- Learn the basic settings of the SEL 487 relay.
- Set SEL 487 relay to trip to an internal fault and not to trip in an external fault.
- See how saturation of CT can lead to relay misoperation.

Lab Tasks:

- The power system can be configured as shown below.
- Set differential relay protection (slopes, CT's ratio).



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- Case1: Apply 3ph, DLG, SLG, and LL faults at FA (Internal fault) and FB (External fault). The relay should trip for internal faults only.
 - Case2: Adjust the characteristic of CT 3 to saturate for external faults and apply different type of external faults. Make sure the relay trips for external faults.
 - Case3: Apply an evolving fault with an external fault followed by an internal fault with fault resistance. The relay should trip for the internal fault.

Lab Report:

- Your lab report should contain your settings for the relay, a table listing whether the relay tripped for each fault case, including an indication on whether the action was correct or not.
- **Pre-lab calculation:**
 - Calculate the operating and restraint currents for the relay setting.