3.6 Protection of bus bars:

Busbar:

• A busbar is a metallic strip or bar that conducts electricity inside a substation.• It is made of copper or aluminium.

Figure: 3.6.1 Protection of busbars

[Source: "Principles of Powersystem" by V.K.Mehta, Page: 341]

Busbar Faults:

• Failure of insulation due to material deterioration.

• Failure of circuit breaker

• Earth fault

• Flashover due to overvoltages

• Errors in the operation of switchgear

• Accidents due to foreign bodies falling on the busbars

• Flashover due to heavily polluted insulator.

Protection of Busbars:

- Frame leakage protection
- Circulating current protection

3.6.1 Frame Leakage Protection:

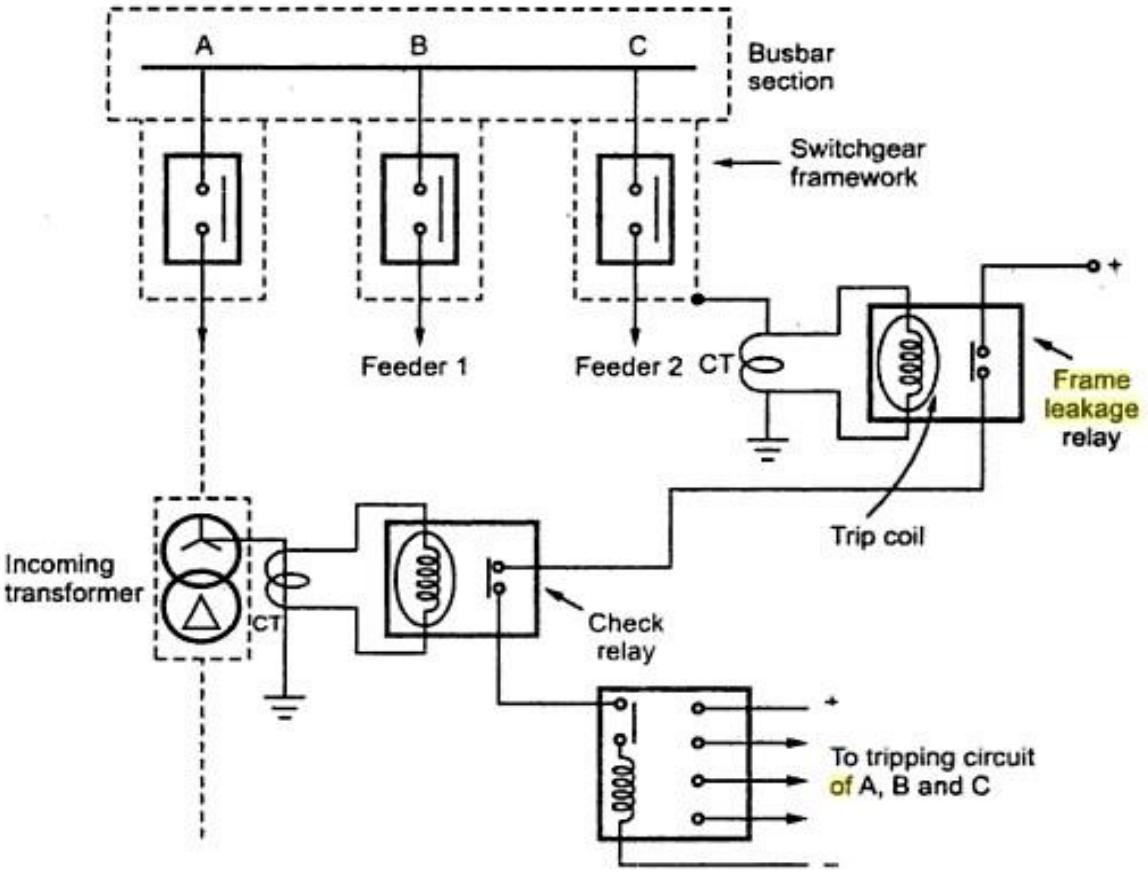
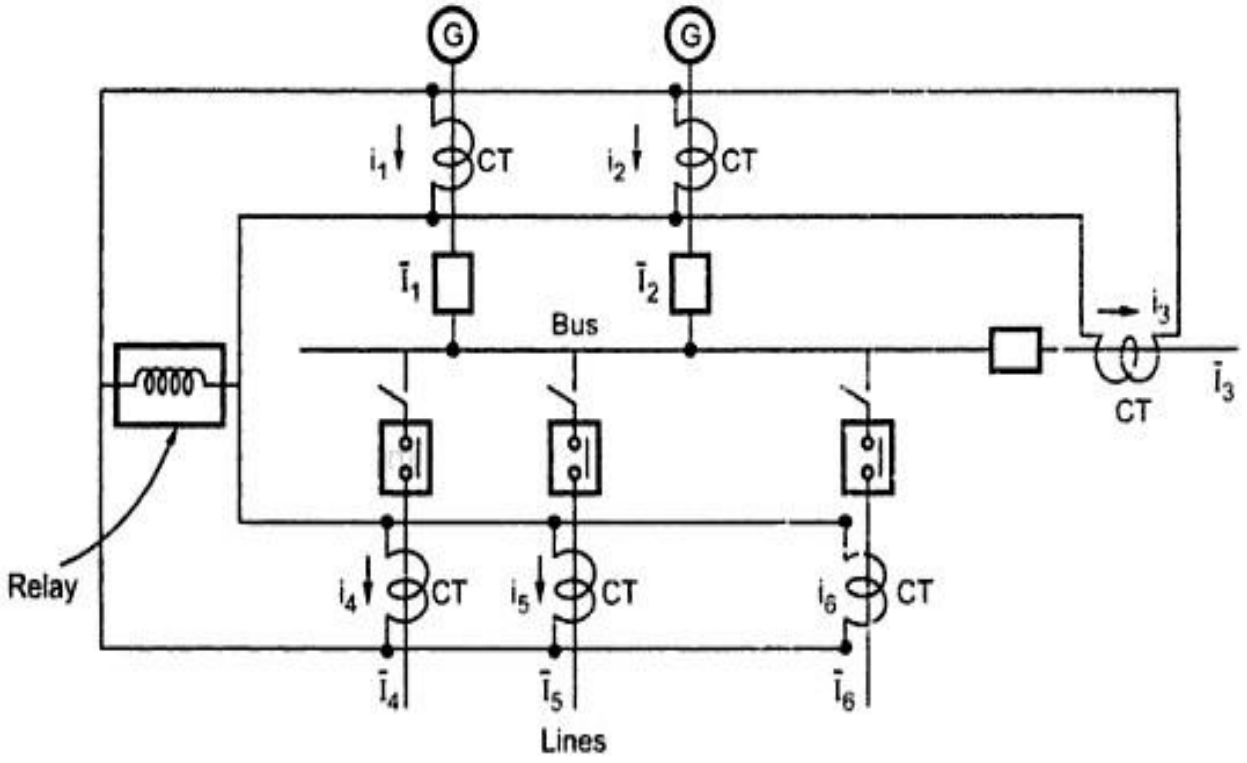


Figure: 3.6.2 Frame Leakage Protection

[Source: "Principles of Powersystem" by V.K.Mehta, Page: 342]

3.6.2 Circulating Current Protection:



I_1, I_2 ..... I_6 are the currents in the circuits connected to the busbar.

Under normal condition, $\sum I = 0$.

i.e. $\bar{I}_1 + \bar{I}_2 + \bar{I}_3 + \bar{I}_4 + \bar{I}_5 + \bar{I}_6 = 0$ (vector sum)

No current flows through the relay and hence remains inoperative.