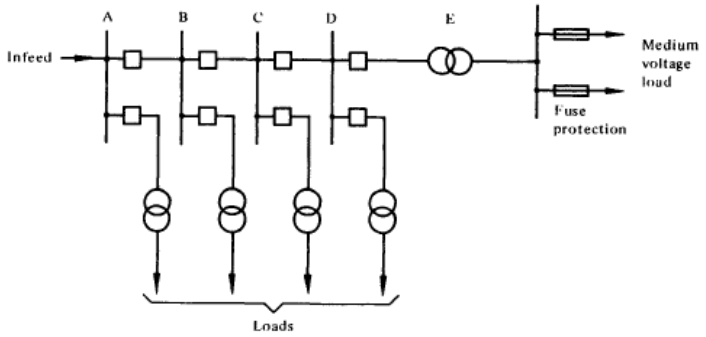
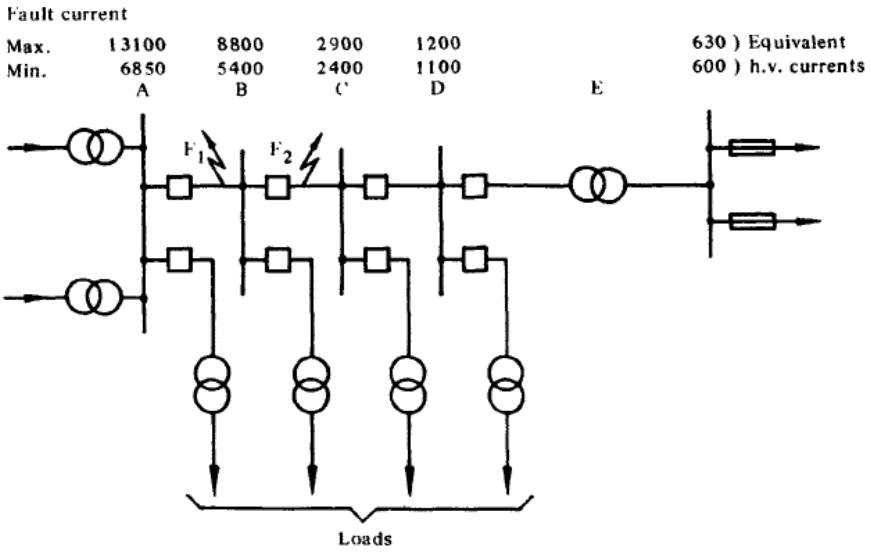
Grading of current settings

- If protection is given to the system shown below by simple instantaneous tripping devices, set so that those furthest from the power source operate with the lowest current values and progressively higher settings apply to each stage back towards the source, then if the current were to increase through the range of settings, the device with the lowest setting of those affected would operate first and disconnect the overload at the nearest point.



- Faults, however, rarely occur in this way; a short circuit on the system will immediately establish a large current of many times the trip settings likely to be adopted, and would cause all the tripping devices to operate simultaneously.

- The position would appear to be better when the feeder sections have sufficient impedance to cause the prospective short-circuit current to vary substantially over the length of the radial system, as indicated in the figure below.



- One might attempt to set the circuit breaker trips to just operate with the expected fault current at the end of the associated feeder section, but this would not be successful since: