P.U. IMPEDANCE DIAGRAM FOR THE POWER SYSTEM

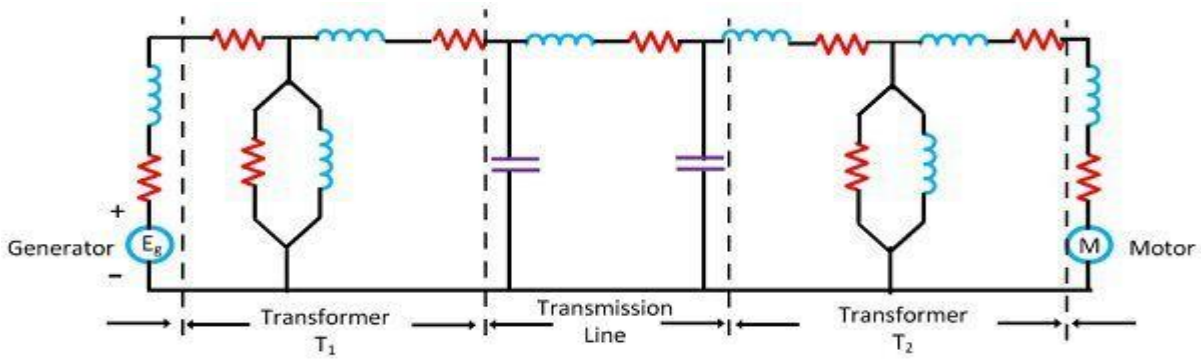
Impedance diagram:

The impedance diagram on single-phase basis for use under balanced conditions can be easily drawn from the SLD. The following assumptions are made in obtaining the impedance diagrams.

Assumptions:

1. The single phase transformer equivalents are shown as ideals with impedance on appropriate side (LV/HV),
2. The magnetizing reactance of transformers are negligible,
3. The generators are represented as constant voltage sources with series resistance or reactance,
4. The transmission lines are approximated by their equivalent -Models,
5. The loads are assumed to be passive and are represented by a series branch of Resistance or reactance
6. Since the balanced conditions are assumed, the neutral grounding impedance do not appear in the impedance diagram.

In impedance diagram, each component is represented by its equivalent circuit, e.g., the synchronous generator at the generating station by a voltage source in series with the resistance and reactance, the transformer by a nominal ∏-equivalent circuit. The load is assumed to be passive and is represented by a resistive and inductive reactance in the series. Neutral earthing impedance does not appear in the diagram as the balanced condition is assumed.



Impedance Diagram For The Power System

The diagram shown below is the balanced 3-phase diagram. It is also called positive sequence diagram. Three separate diagrams are also used for representing the positive, negative and zero sequence networks. The three separate impedance diagrams are used in the short circuit for the studies of unsymmetrical fault. The impedance diagram can further be simplified by making certain assumptions and reduced to simplified reactance. Reactance diagram is drawn by neglecting the effective resistance of generator armature, transformer winding resistance, transmission line resistance line charging and the magnetizing circuit of transformers.