

Chapter-2

(Concepts of Electrical Faults)

Presented By

Hasan Murad Munna

Introduction:

- In other words, the fault is the abnormal condition of the electrical system which damages the electrical equipment and disturbs the normal flow of the electric current. The fault reduces the insulation strength between phase conductors and earth or any earthed screen surrounding the conductors.

Define Electrical Faults:

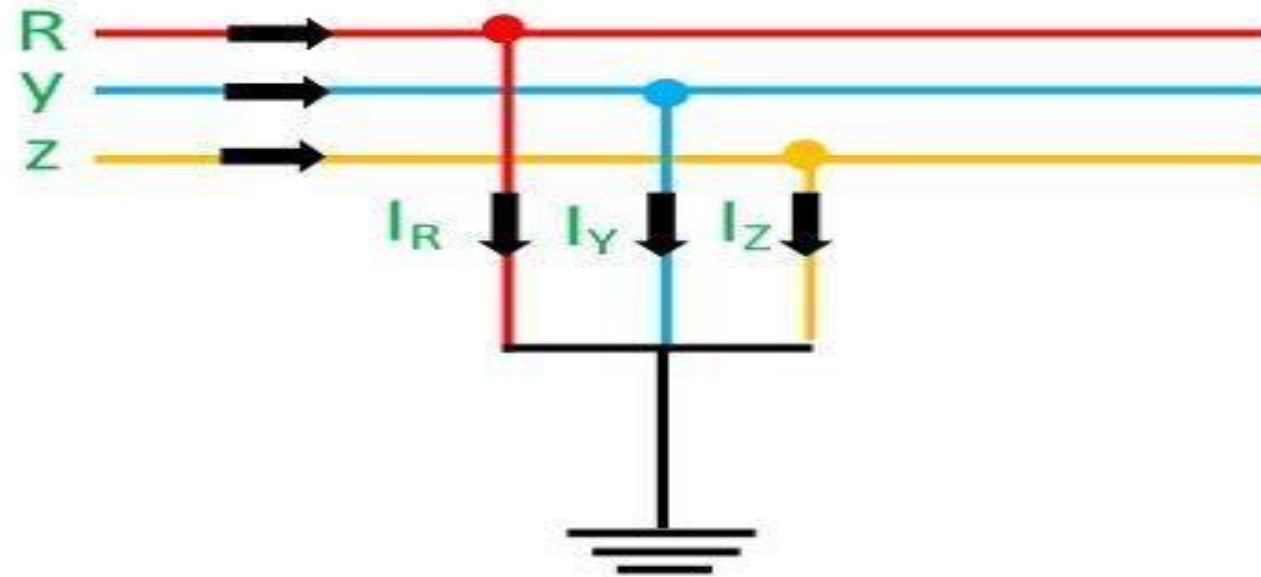
- In an electric power system, a fault or fault current is any abnormal electric current. For example, a short circuit is a fault in which a live wire touches a neutral or ground wire. An open-circuit fault occurs if a circuit is interrupted by a failure of a current-carrying wire or a blown fuse or circuit breaker.

Different types of faults in electrical power System:

- There are two types of fault in Electrical Power System;
 - 1.Symmetrical faults
 - 2.Unsymmetrical faults

- **Symmetrical faults:**

- In such types of faults, all the phases are short-circuited to each other and often to earth. Such fault is balanced in the sense that the systems remain symmetrical, or we can say the lines displaced by an equal angle (i.e. 120° in three phase line). It is the most severe type of fault involving largest current, but it occurs rarely. For this reason balanced short-circuit calculation is performed to determine these large currents.



Symmetrical Fault

- **Unsymmetrical faults:**

- Unsymmetrical faults involve only one or two phases. In unsymmetrical faults the three phase lines become unbalanced. Such types of faults occur between line-to-ground or between lines. An unsymmetrical series fault is between phases or between phase-to-ground, whereas unsymmetrical shunt fault is an unbalanced in the line impedances. Shunt fault in the three phase system can be classified as;

- Single line-to-ground fault (LG).
- Line-to-line fault (LL).
- Double Line-to-ground fault (LLG).
- Three-phase short circuit fault (LLL).
- Three-phase-to-ground fault (LLLG)