

Solid Grounding

NEUTRAL GROUNDING, POWER SYSTEM

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Solid Grounding or Effective Grounding:

When the neutral point of a 3-phase system (e.g. 3-phase generator, 3-phase transformer etc.) is directly connected to earth (i.e. soil) through a wire of negligible resistance and reactance, it is called Solid Grounding or Effective Grounding.

Fig. 26.11 shows the solid grounding of the neutral point. Since the neutral point is directly connected to earth through a wire, the neutral point is held at earth potential under all conditions. Therefore, under fault conditions, the voltage of any conductor to earth will not exceed the normal phase voltage of the system.

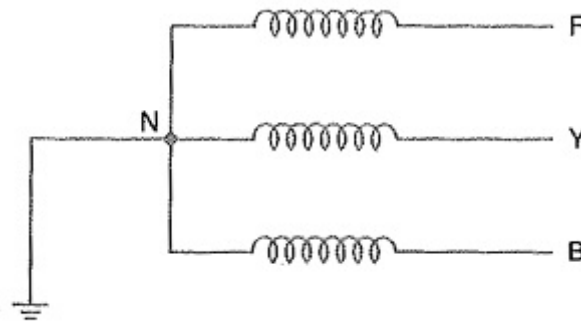


Fig. 26.11

The solid grounding of neutral point has the following advantages :

1. The neutral is effectively held at earth potential.
- 2.. When earth fault occurs on any phase, the resultant capacitive current I_C is in phase opposition to the fault current I_F . The two currents completely cancel each other. Therefore, no arcing ground or over-voltage conditions can occur. Consider a line to ground fault in line B as shown in Fig. 26.12. The capacitive currents flowing in the healthy phases R and Y are I_R and I_Y respectively. The resultant capacitive current I_C is the phasor sum of I_R and I_Y . In addition to these capacitive currents, the power source also supplies the fault current I_F . This fault current will go from fault point to earth, then to neutral point N and back to the fault point through the faulty phase. The path of I_C is capacitive and that of I_F is inductive. The two currents are in phase opposition and completely cancel each other. Therefore, no arcing ground phenomenon or over-voltage conditions can occur.

