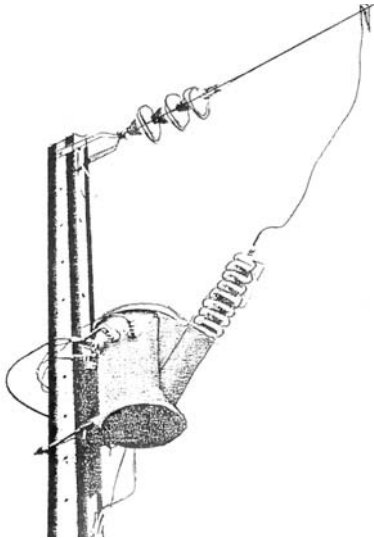


## SWER (Single Wire Earth Return) Systems

One method of providing electrical power in remote rural areas is the Single Wire Earth Return (SWER) system.

Rural areas are generally a special case where load units are comparatively small and their points of application widely dispersed.

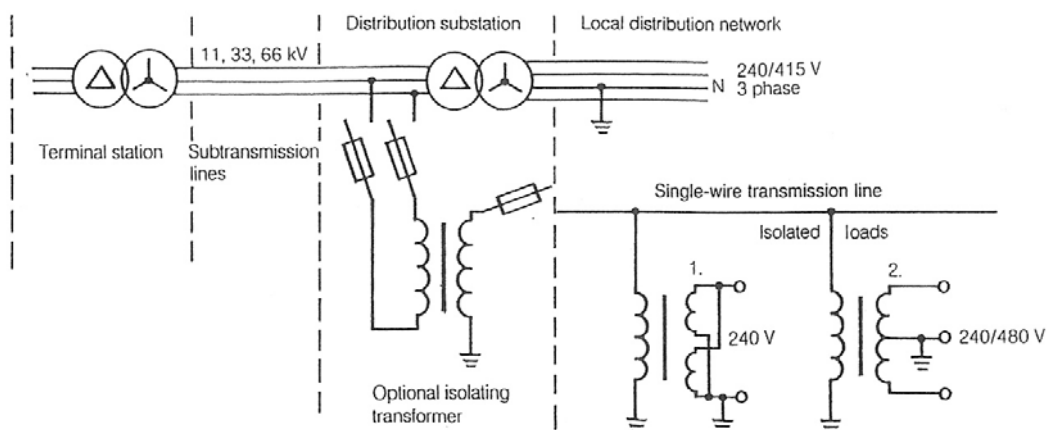


The diagram shows an isolating transformer connected to the sub transmission lines. The secondary voltage of the transformer is connected to a single conductor which traverses the countryside. The voltage of this line can vary between states and regions. If the isolating transformer is omitted, and the SWER line fed directly from one conductor of a three phase 33 kV line, the phase voltage to earth is 19 kV. In some localities the other phases are led out in different directions, so providing a balancing effect on the line.

*End transformer on a SWER line. The link joining the two secondaries can be seen enabling a 240/480V system to be used.*

Because of the high voltage, both line currents and the earth return currents are small. In areas where large amounts of metal are in the ground, special bonding arrangements may have to be undertaken to limit the amount of electrolytic corrosion taking place. These ground currents effectively prevent the system being used in larger population centres.

Transformers are provided at the point of distribution to reduce the supply voltage to either 240V or 480V. Effectively, there are two secondaries on an SWER transformer, they can be connected either in series or parallel, depending on the use to which transformer is to be put. See diagram below.



*Single Wire Earth Return (SWER) system*